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MORTALITY IN A RURAL ZULU COMMUNITY

BY

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Death rates for Native Reserves in South Africa are scarce because there are few places where the population is adequately known. Although notification of births and deaths is compulsory, only a small percentage are reported, and this is especially true of neonatal deaths. Reasons for the non-existence of these records have been discussed by Myburgh (1956), and alternative methods for obtaining death rates by sampling in rural Rhodesia have been described by Shaul (1955) and in South Africa by Sachs (1953). The only death rates for a rural area in South Africa come in fact from Polela District (Kark and Cassel, 1952; Kark and Chesler, 1956; Brookes and Hurwitz, 1957), which is the area discussed in this paper. There are few African reserves where facilities exist for making a diagnosis before death, as it is exceptional for anyone to be admitted to hospital or even seen by a general practitioner, and post mortem examinations are usually reserved for deaths due to unnatural causes. However, an attempt will be made to indicate recent death rates and their trends and causes in Polela.

Population Studied and Methods Employed

Data were obtained from the Polela Health Centre (Union Health Department), which is situated in Location 2 of Polela District in South-west Natal. In 1940 this Health Centre began to study the homes around it, using, amongst others, field workers known as Health Assistants, whose duties included routine census work and notification of births and deaths. Barely 800 people were included in the first demographic survey, but by 1958 the group included more than 10,000 people in approximately 1,000 rural Zulu homes (about two-thirds of the location), and these individuals have since been kept under constant surveillance. As the same group has been the subject of numerous studies by Kark, E. (1943), Kark, S. L. (1942, 1943, 1949, 1950, 1951, 1954, 1957), Cassel (1955, 1957), Slome (1956), Jaspan (1950, 1953), Thompson (1954), Mingay (1958), and Hey (1957), only a few of the background details need be given here.

The inhabitants of Polela District are mainly Zulus who have adopted the Baca material culture (which suits the climate), and their homes are situated in 450 square miles of mountainous country traversed by the deep valleys of the Umkomaas River and its tributaries. The climate is temperate with cold winters, and consequently there is no malaria or bilharzia. The Reserve is rapidly becoming over-populated and the land seriously eroded. Thus, one area with 114 homes and 887 people in 1943 had 184 homes and 1,509 people by 1958—an increase of about 70 per cent. in 15 years.

The main crop is maize, but the yield per family is so small that it is seldom sufficient for more than 3 months of each year. The gross overstocking of the pastures with goats and cattle is actually understocking as far as the human need for protein is concerned, and the universal poverty and lack of natural fencing material precludes successful vegetable, legume, or poultry production. So far from ever exporting foodstuffs, as do other rural areas, Polela is unable to support its own population and has to import food. As a result of this situation, more and more men, and recently even women, have been forced to seek work in towns in order to get money for purchasing food. At present, half the men between the ages of 40 and 50 and about three-quarters

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of the men between the ages of 25 and 40 are away most of the time, and the permanent residents consist mainly of children, adolescents, women, invalids, and senile men. Nevertheless, the migrant men are included in this study because they often return home to die, and should they die elsewhere the circumstances of death are usually known and the effects are felt by the rest of the family. The migrants constantly re-introduce infections such as tuberculosis, amoebiasis, and venereal disease into the Reserve, and their mode of life tends to undermine traditional family and social customs, though complete disruption is prevented by the extensive webs of kinship which bind together the remaining people.

The standard of education and consequently the earning power of the people is low, and ignorance is an important factor in the causation of death. At the present time nearly all the old people are illiterate, and although about two-thirds of the working adults went to school, only 6 per cent. reached Standard 3. Nowadays approximately 85 per cent. of children are attending school by the age of 13 and nearly 20 per cent. have already reached or passed Standard 3 at that age. As one-third of the population is now of school age this fact is already affecting the mortality rates. A small but ever-growing body (at present 2 per cent.) of Africans have obtained professional qualifications and are working in the Reserve as health workers, teachers, or ministers of religion. They are a force behind the attempts to raise the standard of living and diminish the death rate. Heathenism in Africa is closely associated with lack of education and adherence to traditional beliefs and remedies, and although Polela is predominantly Catholic, about one-sixth of the homes are still heathen and one-tenth of the population still refuses medical treatment on religious grounds.

In short, poverty, migrancy, ignorance, and malnutrition are rife in Polela and all of these are aggravated by tribal and religious beliefs, as in other African Reserves. To many of the people themselves this study would be pointless, for to them death is usually due to bewitchment and is usually announced by the statement, "They have killed him".

1958 Census of Population (Table I)

According to a census taken in May, 1958, there were 10,607 people in the study group, 5 per cent. of whom were 59 years of age or older and 37 per cent. under 10 years. There were slightly more females (5,499) than males (5,106).

TABLE I

CENSUS OF POPULATION STUDIED, INCLUDING TEMPORARY MIGRANTS (13.5.58)

Date of Birth	Sex		Per cent. of Population
	Male	Female	
–1879	21	41	0·58
1880–1889	64	79	1·34
1890–1899	142	187	3·10
1900–1909	286	348	5·97
1910–1914	202	214	3·92
1915–1919	272	259	5·00
1920–1924	300	374	6·35
1925–1929	336	430	7·22
1930–1934	418	474	8·41
1935–1939	493	518	9·53
1940–1944	525	504	9·70
1945–1949	696	663	12·81
1950–1954	802	818	15·27
1955	186	169	3·34
1956	168	159	3·08
1957	155	189	3·24
1958	48	67	1·08
Totals	5,106	5,499	100

Death Rates, 1945–56

Comparison of three 2-year periods between 1945 and 1956 (Table II) revealed a reduction in the death rate which was greatest for deaths between 1 month and 1 year and least for neonatal deaths and stillbirths. The reasons for the changes between 1945 and 1951 have been discussed by Kark and Cassel (1952), who attributed them more to health education and preventive measures by a community-orientated team than to the curative facilities available.

TABLE II

DEATH RATES IN THREE PERIODS BETWEEN 1945 AND 1956

Period		1945–6	1950–1	1955–6	Approximate Percentage Reduction in Mortality over 10 yrs
Total Population (average for 2-year period) ..		5,963	8,015	10,024	
Total Live Births ..		426	624	720	
Infant Mortality Rate per 1,000 Live Births ..		202	106	86	*57**
Neonatal Mortality Rate per 1,000 Live and Stillbirths		54	40	50	*7*
Stillbirth Rate per 1,000 Total Population ..		36	40	31	*14*
General Death Rate per 1,000 Total Population by Age (yrs)	0– 4	60	23	18	*70*
	5–14	4	3	2	*50*
	15–34	6	5	4	*33*
	35+	30	23	22	*27*
	All ages	24	16	12	*50*

* Reduction in the death rate for ages 1 to 12 months = 76 per cent.

Although a pre-school health programme has been operating for the last 10 years, and, generally speaking, earlier use is also made of its steadily improving

services, it is probably that the fall in the death rate for the 1 to 5-year-old group was in fact due to the well-received and intensive welfare service, which aimed at improving both the state of nutrition and the immunity of the baby *up to the age of 2 years* and also the mothers' knowledge and technique of child-rearing.

Cohort Analysis of Deaths

The precise number of people born in each year is not readily available, but an analysis of the 1945–46 and 1955–56 deaths for 10 cohorts suggests that there has been slight decrease in the death rate, which is greater for men born before 1880 than for any other group. It is, however, noticeable that, for women born between 1925 and 1929, the 1955–56 death rate was lower than that for women born between 1930 and 1934. The rapid extinction of the older age cohorts is also shown in Table III.

Table III

DEATH RATES PER THOUSAND FOR TEN COHORTS

Sex		Male		Female	
Period		1945–6	1955–6	1945–6	1955–6
Cohort	–1880	129·7	205·3	62·5	86
	–1889	47·7	50·8	37·2	52·8
	–1899	17·3	32·7	17·1	35·8
	–1909	27·7	12·6	12·2	18·0
	–1914	10·3	4·1	12·1	6·7
	–1919	6·4	10·6	12·7	11·3
	–1924	7·2	4·7	9·1	2·7
	–1929	4·1	7·1	1·3	3·5
	–1934	1·3	0·0	2·6	6·0
	–1939	1·4	3·0	10·6	2·8

The oblique lines indicate corresponding death rates for two adjacent cohorts.

Since 1945 there has been a change in the order of the age groups when ranked according to their percentage contribution to the annual deaths (Table IV). By 1955 the main contribution to the death rate was coming from old people, but 10 years previously it had come from infant deaths.

Table IV

PROPORTIONAL AGE DISTRIBUTION OF DEATHS (1945 AND 1955)

Age (yrs)	1945			1955		
	No. of Deaths	Per cent. of Total for Year	Rank	No. of Deaths	Per cent. of Total for Year	Rank
Under 1	37	32	1	28	24	2
1– 5	26	23	2	21	19	4
6–18	7	6	5	6	5	5
19–55	27	23	3	25	20	3
Over 55	19	16	4	38	32	1
Total	116	100		118	100	

Causes of Death

Before 1949 very few causes of death were recorded, presumably because so few people were receiving medical attention at that time. Reference is made, however, to whooping cough, often associated with "malignant" malnutrition" (kwashiorkor), as an important cause of death in 1945. In the same year, a survey of twenty homes in which deaths had occurred showed that six deaths were probably due to tuberculosis, and prematurity associated with multiple births is cited in one early report as an important cause of neonatal death. A more detailed analysis of the causes of death was made for the years 1950–51, but this dealt only with adolescents and adults. At this time the commonest diagnoses were tuberculosis, dysentery, violence, and hypertensive heart failure.

Known and unknown causes of death for the period 1949–1953 are shown in Table V.

Table V

CAUSES OF DEATH IN TWO SUCCESSIVE PERIODS 1949–51 AND 1952–53

Main Category (International Classification)	Sub-Category	Period		Total
		1949–51	1952–53	
I Infective Diseases	Leprosy	—	1	1
	Tuberculosis ..	30	62	92
	Syphilis	5	2	7
	Intestinal Infections ..	41	43	84
	Other Infections	8	2	10
II Neoplasms	—	7	5	12
VI Diseases of Central Nervous System	Cerebral Abscess	1	—	1
	Thrombosis and Haemorrhage	2	2	4
	Epilepsy	2	1	3
VII Cardiovascular Diseases	Congestive Heart Failure ..	17	27	44
VIII Respiratory Diseases	Pneumonia ..	11	9	20
	Other Unspecified	10	24	34
XI Pregnancy	Puerperal Sepsis	—	1	1
	Abortion.. ..	1	—	1
	Post-partem Haemorrhage	1	—	1
XIV Congenital Defects		2	—	2
XV Diseases of Infancy	Kwashiokor ..	20	9	29
	Prematurity and Birth Injury	16	26	42
XVII Accidents	Violence and Injury	13	18	31
XVI Ill-defined	Senility	2	—	2
	Unknown ..	186	96	282
Totals		375	328	703

Populations at Risk 1949 6,624 1950 7,481 1951 8,549 1952 8,962 1953 9,206

Of the 421 deaths of which the cause was known 250 (59 per cent. of known causes and 36 per cent. of all deaths) were due to infections—the most common being tuberculosis and other respiratory (146) and gastro-intestinal (84) disorders; ten other infections (mainly spread by contact) formed a negligible group (only 2·3 per cent.). Vector-borne diseases do not appear in the list but it is possible that in some cases tuberculosis, respiratory disease, and diarrhoea were transmitted from animals, the most likely being cattle, poultry, and rats. No less than 40 per cent. of deaths during these 5 years were due to unknown causes.

The more detailed records for the period 1955–58 allow sub-division by age and cause of death (see Tables VI and VII). During this period 14·1 per cent. of deaths occurred before the age of one month, a further 24·5 per cent. before the age of 6 years, and a further 28·8 per cent. between 6 and 55 years. Deaths at older ages represented 32·6 per cent. of all deaths.

TABLE VI

CAUSES OF DEATH, 1955–58, IN INFANTS UNDER 5 YEARS OLD

Cause of Death	Still-births	Deaths		
		Neo-natal	1 to 12 mths	1 to 5 yrs
Toxaemia of Pregnancy	2	1	—	—
Placenta Praevia	1	2	—	—
Other Obstetrical Causes	7	5	—	—
Prematurity	4	26	—	—
Tetanus	—	3	—	—
Intestinal Infections	—	7	14	18
Pneumonia and Other Infections	—	4	10	5
Haemorrhage and Jaundice	—	3	—	1
Congenital Defects	—	1	2	—
Kwashiokor	—	—	3	26
Marasmus	—	—	10	3
Tuberculosis	—	—	—	6
Convulsions	—	1	2	3
Accidents	—	—	—	2
Poliomyelitis	—	—	—	1
Neoplasms	—	—	—	1
Unknown	20	22	9	14
Total	34	75	50	80

TABLE VII

CAUSES OF DEATH, 1955–58, IN PERSONS OVER 5 YEARS OLD

Diagnostic Group		Age Group (yrs)		
		5–18	19–55	Over 55
I Tuberculosis		3	31	11
Intestinal Infections		2	6	5
Other Infective Diseases		4	—	1
II Neoplasms		—	7	13
VI Epilepsy		—	3	1
Cerebrovascular Disease		—	3	6
VII Cardiovascular Disease		2	19	35
VIII Pneumonia		1	—	8
Other Respiratory Disease		1	7	9
IX Hepatic Cirrhosis		—	1	1
X Uraemia		—	—	1
XI Pregnancy		—	2	—
XVII Violence and Injury		4	19	9
XVI Senility		—	—	11
Unknown		7	31	62
Total Deaths	Male	14	62	77
	Female	10	67	96
	Total	24	129	173

Stillbirths.—The Wassermann reaction, which was done in 27 out of the 34 women whose babies were stillborn, was negative in all but one, who had received two courses of penicillin during pregnancy. In three of the seven women whose serology was unknown there were well-defined reasons for the stillbirth; it is thus unlikely that syphilis could have contributed to more than 20 per cent. of stillbirths, and a more likely figure is 5 per cent. That syphilis had previously been a more important factor is evident from a 1949–1953 estimation that 8·9 per cent. of pregnant women with positive serological tests had stillbirths, compared with only 3·4 per cent. of those with negative serological tests (Kark and Chesler, 1956). In the period 1957 to 1958, only two of the 21 women who had stillbirths had not attended ante-natal sessions at Polela Health Centre, and during these years 80 per cent. of all pregnant women attended for routine ante-natal care. For 20 per cent. of the stillbirths obstetrical complications were anticipated and the mother was delivered in hospital. According to the figures shown in Table II, there has been little reduction in stillbirths over the years, in spite of an increasing acceptance by the women of ante-natal care and skilled delivery. As great emphasis has been laid on maternal nutrition and education, and as diets have frequently been supplemented with dried milk powder, vegetables, and vitamins, one is left with the conviction that the universal poverty, soil erosion, maize diet, and consequent life-long malnutrition are the ineradicable basic factors in the majority of stillbirths. The relationship between maternal nutrition and foetal and neonatal wastage has been summarized by Stearns (1958) and Hepner (1958), who have produced a strong case for the idea that maternal malnutrition constitutes an important causal factor in stillbirths. In Polela these were often associated with premature labour and uterine inertia, and it is

possible that nutritional factors accounted for as many as 25 out of the 34 recorded stillbirths, though a high proportion of unknown causes is a feature of stillbirth investigations in other countries.

If left to themselves, the Zulus in Polela usually follow a policy of non-interference during labour, but there is a tendency to advise premature bearing down if labour is not progressing rapidly. This may be a contributory cause of stillbirth, but on the whole the traditional native delivery techniques do not appear to have been more lethal than the more civilized methods, except in complicated cases, where skilled delivery has been shown to be definitely superior.

Neonatal Deaths.—Some of the causes of neonatal deaths could have been minimized, particularly those associated with the premature delivery of twins. "Prematurity" accounted for one-third of neonatal deaths. It was associated with multiple pregnancy in half, and maternal malnutrition was probably an important factor in these and other cases. During 1957 and 1958 there were twenty pairs of twins from 703 confinements, an incidence of one in 35, which is more than twice the twin rate found at Guy's Hospital. At least one-third of the neonatal deaths were due to infections, one-quarter of which gained entrance through the umbilical stump. The apparent rarity of respiratory infections in the first month of life may be due to the fact that fulminating cases are not readily appreciated in premature babies and therefore tend to fall into the unknown or premature groups. Continuous education at the Health Centre has almost completely eradicated the original practice of feeding babies with gruel during the first few days of life, and nowadays initially unsupplemented breast-feeding is the rule. The incidence of gastro-enteritis is consequently low in the neonatal period, and it is worthy of note that two of the seven cases occurred in premature infants who were artificially fed in hospital. The unknown causes of death in the neonatal period probably include a high proportion of congenital abnormalities and birth injuries.

Other Infant Deaths.—Gastro-enteritis was the most important cause of death between birth and 12 months (31 per cent. of this group) and was often a complicating factor in the 26 per cent. of deaths ascribed to marasmus and kwashiorkor. Intestinal infections were commonest in February and March, which besides being late summer or early autumn months were also the times of child neglect through the mothers absence in the fields for weeding. In Polela illegitimacy did not appear to be an important factor in infant deaths, and only one mother conceived her child in a town, returned to the Reserve for her confinement, and then returned to the town, leaving the baby with its milkless grandparents. But it is likely that comparable situations will be more frequent in the future.

About one-third of the deaths in this group were of first babies, suggesting that lack of experience in recognizing the presence of infection or the value of European medicine were acting as a contributory cause of death. Barely half the children who might have come to the Clinic were actually brought before death—the main reasons for not seeking help being distance from the Health Centre or adherence of the parents to religious sects prohibiting medical treatment.

The frequency of bronchopneumonia as a cause of death in this group was not a surprise, and some of the deaths due to unknown causes were doubtless due to respiratory infections. Marasmus from failure to establish or continue breast-feeding was an equally important cause of death, as it was seldom possible for the mother or guardian to obtain or afford sufficient cow's milk or other source of protein. Two of the deaths in this category were due to the mother's death, and in other cases breast abscess or cracked nipples (relatively common in Polela, but apparently rare in Natal hospital populations) had fatal consequences. Boys contributed 57 per cent. of deaths in this age group.

Deaths between 1 and 5 years.—Kwashiorkor and intestinal infections were the commonest causes of death in the 1 to 5-year-old group, and most deaths occurred in January, February, and March. As only seventeen cases of kwashiorkor were seen (or known to field workers) at the Health Centre in 1956, compared with 53 and 61 respectively in the two following years, it is clear that the incidence is rising through increasing protein shortage, though the case mortality is decreasing, through improved and more prolonged treatment. There were three peak incidences of kwashiorkor in Polela district:

(1) March–April (probably due to maternal deprivation because of weeding duties in February);

(2) June–August (the winter months associated with extreme cow's milk shortage);

(3) November–December (seasonal duties and the peak pellagra months which might lead to reduction in human milk supplies).

Provision of more subsidized dried milk powder or any other suitable source of protein appears to be the only solution to this particular tragedy: at present milk can only be prescribed from the Health Centre as a curative medicine and is not available prophylactically—a strange position for a disease which can be recognized by gingering hair and failure in growth long before it could be described as "malignant malnutrition". Previously this condition was attributed to ignorance and faulty weaning, but these reasons are unimportant to-day, as the mothers are now well informed and would give their babies any protein that was available. A high incidence of gasto-enteritis is only to be expected in a community with low standards of hygiene, and there were probably several such cases as well as cases of kwashiorkor among the deaths from unknown causes.

Table II shows that deaths between 1 and 5 years of age declined rapidly between the first two periods but only slightly between the second and third periods. The rapid decline can probably be ascribed to the improvements which were introduced with the Health Centre, but there remain many social and economic causes of death which are not amenable to medical treatment, including disrupted family life and lack of opportunity to earn a reasonable salary, and it is these which appear to be root causes of kwashiorkor in South Africa.

Later Deaths.—For children over 5 years of age serious afflictions, such as a bolt of lightning, massive necrosis of the liver, or a fulminating meningitis seemed to be required to cause death; it is not until after the age of 18 that the diseases of young persons—tuberculosis and rheumatic fever—begin to feature markedly in the mortality statistics.

There were 42 deaths of persons between the ages of 19 and 55 which occurred away from home, either in hospital or in distant towns or farms. Nevertheless, the predominantly male deaths which can be ascribed to migrant habits (*viz.* traffic accidents, amoebiasis, and tuberculosis) were balanced by female deaths associated with pregnancy, making almost equal numbers of deaths in the two sexes. Pulmonary tuberculosis was the greatest single cause of death in this age group; it is hoped that when antibiotic treatment becomes more widely available and accepted the mortality rate will be reduced, though a radical alteration of socio-economic conditions may be needed to reduce the morbidity rate. Congestive cardiac failure in persons under the age of 55 was usually due to rheumatic heart lesions or to hypertension, often associated with nephritis and pyelonephritis.

The one-quarter of deaths from unknown causes were equally divided between the two sexes and probably included several due to tuberculosis, cardiac failure, and pneumonia.

After the age of 55 certification of causes of death was less satisfactory, and no less than 60 per cent. of the individuals who died were not seen in their last illness. Sufficient was known about some of these cases to enable them to be placed in one of the diagnostic categories (*e.g.* "probably congestive heart failure"). There remained, however, 35 per cent. of deaths which were due to unknown causes or, more often, occurred in individuals who had never been seen by a doctor or Health Centre Assistant. European patients usually consult their doctors more frequently as they get older, but aged Bantu usually go to herbalists and diviners. It is often difficult to transport an aged ill person, and old women are rarely able to travel on horseback. Hence the percentage of cases seen before death in each locality was proportional to the accessibility of the area by the Health Centre ambulance. Polela Health Centre was exceptional in seeing as many as 40 per cent. of the old people before death, and this relatively high proportion is the result of years of community health education in this district.

Tuberculosis, respiratory infections, carcinoma, and cardiac failure appear to be the commonest causes of death after the age of 55, and several of the deaths due to unknown causes probably fall into this group.

The basic causes of the heart failure and respiratory disease are obscure, and further research is needed to recognize the roles of chronic bronchitis, malnutrition, and degenerative vascular processes. That malnutrition plays a part in some of these deaths is evident from the fact that the peak incidence of deaths from unknown causes and cardiac failure occurs in the peak pellagra and starvation months of October, September, November, and December. These are also months when the aged are left alone at home whilst the able-bodied adults do the ploughing. Numerous obscure cases of diffuse pulmonary fibrosis, asthma, and bronchitis are seen in elderly people in Polela District; this makes one wonder how many are due to snuff-taking, to repeated exposure to cold in moving from one hut to another, to smoke-filled huts, or to the soot which filters down from thatched roofs.

Only one death due to coronary thrombosis was recorded, but it is possible that there were others in the "never seen" or "unknown cause" groups. As Bantu who have spent most of their working life in towns prefer to end their days in the Reserves, the *post mortem* surveys of town populations (which have revealed relatively few cases of coronary atheroma, diffuse myocardial fibrosis, or endomyocardial fibrosis) do not necessarily exclude these as causes of death in South African Bantu. During the last 4 years at least 4 per cent. of deaths in Polela in old persons were certainly due to hypertension, and there were probably more among the "probable cardiac failures" and "unknowns". But the precise role of chronic nephritis or chronic renal infection in the aetiology of hypertension in this part of the world is still unknown. The very few, frail Africans who survive to 90 do so in spite of years of toil, starvation, and repeated infectious processes.

Secular Trend of Deaths Due to Unknown Causes

In the period 1949–1953 no less than 40·1 per cent. of deaths were due to unknown causes, compared with only 27 per cent. in the period 1955–58. This decline is due to better diagnostic facilities, better attendance at the Health Centre (the number of persons who have never visited the Health Centre is steadily diminishing each year), increased home visiting by the Health Centre staff, and wider use of hospital facilities in difficult cases. But there is still room for improvement, especially at the extremes of life. During the period 1955–58 deaths due to unknown causes represented just under 30 per cent. of neonatal deaths, less than 20 per cent. of deaths between 1 month and 5 years, about 25 per cent. of deaths between 6 and 55 years, and over 35 per cent. for deaths in older persons.

Place of Death.—During the year 1955 there were deaths affecting 106 homes, and the following year 15 per cent. of these homes had a second or third death. These later deaths were often due to the same causes as the earlier death in the same house (*e.g.* tuberculosis, diarrhoea, premature twins, mismanagement of small children by a tribal grandmother, refusal to seek medical treatment for religious reasons) or to related causes (*e.g.* death of a mother followed by starvation of a baby), and for 7 per cent. of all deaths in 1956 the cause could be traced to a similar event in the previous year. Deaths in neighbouring households could also be traced to similar causes, but here there were usually several common factors operating, such as distance from the Health Centre, religious prejudice, and a common source of infection, notably a case of tuberculosis or infected food. The absence of major epidemics of typhoid and diphtheria in Polela is characteristic of this region and is probably due to the continuous medical surveillance of the community by the Health Centre. The occurrence of epidemics in neighbouring districts is evidence that the social and environmental situation is otherwise favourable for such outbreaks.

In 1957 there were 144 deaths, 95 in the patient's own home, fifteen in hospital, fourteen in other houses in the district (including herbal and nursing homes), nine in distant places, six out of doors (drowning and road accidents), and five at the Health Centre (brought in moribund). Compared with other Reserves in South Africa, the Polela figure of 10 per cent. deaths in hospital is an exceptionally high one.

Social Repercussions of Death.—Approximately one-third of the men who died during the period of study had, on average, four dependants, and three-quarters of the women left small children who ran a severe risk of dying from neglect or starvation. These figures give some indication of the serious repercussions of the premature death of an adult in this and other African Reserves.

In conclusion, it must be emphasized that all these statistics are derived from a Reserve in which the people have and use exceptionally good preventive and curative medical services. It is sobering to speculate on the conditions that prevail in Reserves with the same economic, social, and agricultural situation but no medical and social welfare facilities.

Summary

Death rates and causes of death are presented for a rural Zulu community. Attention is drawn to the large number of deaths from unknown causes, and to the work which is being done to obtain better vital statistics for Bantu populations.

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MORBIDITY IN A LONDON GENERAL PRACTICE

SOCIAL AND DEMOGRAPHIC DATA

BY

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Introduction

The material presented here is part of an investigation into psychiatric and associated ill-health occurring in the general population outside hospital. The aim, in addition to methodology, was to assess the prevalence, during one year, of conspicuous psychiatric morbidity in a defined urban population, and to study possible relationships with other illness and with family and social features. These social features, and their connexion with frequency of general practitioner consultation and of illness, are presented below.

The population was defined as the patients of one group practice, and a 20 per cent. random sample was taken (for practical reasons, this was all patients whose surnames began with one of six letters of the alphabet). The risk year was March, 1956, to February, 1957, inclusive, and the period population contained all patients registered in the practice before the beginning of that year. Morbidity was considered conspicuous only if patients consulted the doctors during the risk year, and was defined in terms of the complaints and conditions presenting at those consultations. For the whole sample, data were collected retrospectively from N.H.S. cards and from practice records; further medical data for a sub-sample were obtained in discussions with the doctors; family and social data for two sub-sections were obtained by interviews with two different types of questionnaire, one type being asked of patients in the surgery during the summer following the risk year. For this reason the "questionnaire section" was not a representative sub-sample, being weighted by patients attending surgery and particularly by those with young children; however, the questionnaire section constitutes half the sample, and has given much useful material on social and economic features.

In the *social* field, the data cover age, sex, marital status, size of patient group and of family, duration of registration in the practice; occupation, duration in current job, job history; housing circumstances, duration of living in house; and relatives' medical history. In the *medical* field, the data cover the doctor-patient contacts for consultation purposes (routine clinic attendances were not included) during the risk year, and also during the previous year and the subsequent year; the presenting complaints at each consultation during the risk year; the previous medical history recorded; and, for a large sub-sample, the practitioners' assessment of the psychiatric aspects of the patients' illnesses.

I. Population Features

The group practice, of around 9,000 patients, is in outer S.E. London in a stable residential working-class area. It is largely a family practice centred closely round the surgery, and is run by four doctors on the lines of a health centre; it offers many special facilities—infant welfare, toddlers' clinic, ante-natal service, visiting scheme for the elderly, and so on—and keeps consistent records. The doctors were interested in the investigation and co-operative to the highest degree.

The following descriptions of the population investigated will show that, in the family and socio-economic characteristics which might be relevant to ill-health, the people whose morbidity was studied were not an abnormal or extraordinary group. The sample contained 1,800 patients (814 males, 986 females) of whom over half had been in the practice since before 1949—an indication of the stability of the practice. Table I shows that only 9 per cent. were very recently registered (less than 9 months before the risk year).

Table I

LENGTH OF REGISTRATION IN THE PRACTICE

Length of Registration	Proportion of Patients (per cent.)
Under 9 months	9
9 months–2½ years	12
2½–4½ years	13
4½–6½ years	13
6½–8½ years	35
More than 8½ years	18
All Durations	100

The sex ratio in the sample—45 per cent. males—was a little lower than in the Greater London conurbation or in the S.E. London "newer residential" division of the conurbation (Table II). The marital state of the men in the sample also differed from that in S.E. London; only 14 per cent. of the adult men were single, a very significantly lower proportion than in the rest of S.E. London or in Greater London. Fig. 1 and Table II show that the age composition of the sample diverged somewhat from the usual demographic pattern; children under 15 years formed nearly one-quarter of the sample. In comparison with S.E. London (which itself has a higher proportion of children than does Greater London), this excess of children and of adults aged 30–39 years was offset by an overall deficit of single men in the sample. When we remember the special facilities for babies and toddlers offered in the group practice, the excess of children and their parents is perhaps understandable.

Turning from individuals to *patient groups* (*i.e.* not households, but those members of the household who are patients of this practice), the average size was 2·1 patients per address; in the whole sample, over 40 per cent. of addresses had only one patient. However, for half the sample—the questionnaire section, where the whole household was investigated—several one-patient groups were discovered to have left the district (without removing their N.H.S. cards), and the average size of patient group was 2·75. In the non-questionnaire section the average size

TABLE II

COMPARISON OF THE PRACTICE POPULATION WITH THE POPULATION OF SOUTH EAST LONDON (DIVISION V.D.) AND GREATER LONDON CONURBATION

Sex and Age		Practice	S.E. London	Greater London Conurbation
Sex Ratio	Male	45·2	47·6	46·9
	Female	54·8	52·4	53·1
Proportion Single Persons aged 15+ years	Male	14·4	23·6	25·4
	Female	24·1	23·1	26·2
Proportion of Children under 15 years	Male	26·3	22·2	21·2
	Female	21·2	19·2	17·9

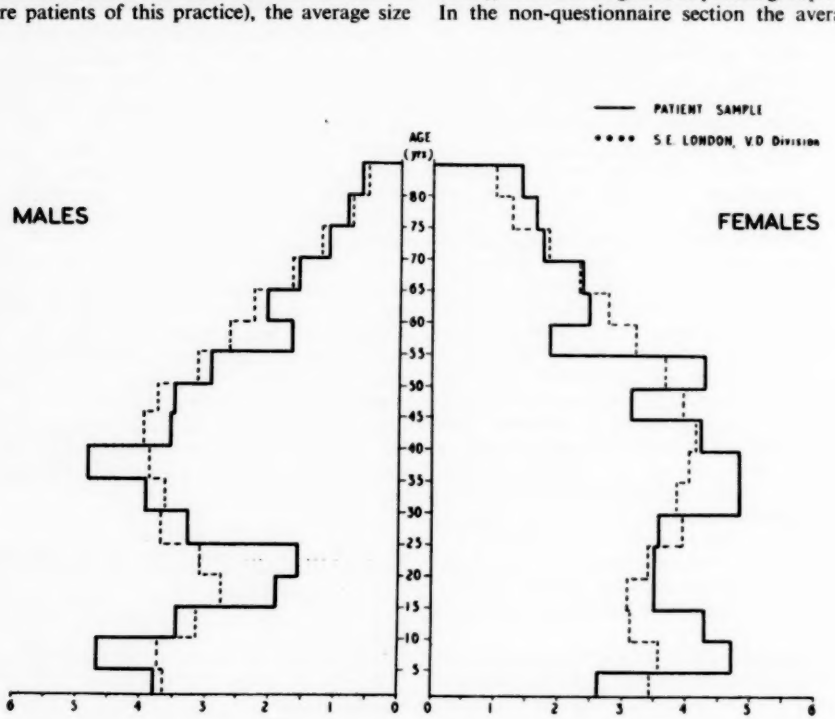

FIG. 1.—Age and sex composition of period population (1,800 patients)

appeared to be only 1·75 patients, but it is likely that this low figure was also due to a fair proportion of the one-patient groups being in reality "dead cards".

The *households* in the questionnaire section yielded interesting material on practice registration. On average, there were 3·49 persons in a household, of whom 2·73 formed the "patient group", another 0·23 were practice patients but not at risk for the full year, and the remaining 0·53 persons were non-patients of this practice. The non-patient members of these households were more commonly men than women, and the tendency for women and their children to attend the same doctor was evident; where there was only one non-patient in the household, it was more commonly an adult married man, but where there were two or more non-patients in the household they were quite commonly women and children.

The questionnaire households were, on average, slightly larger than those in England and Wales (see Table III), and a higher proportion—59 per cent.—contained children under 16 years; indeed, 12·5 per cent. of the questionnaire households had three or more children under 16 years, as compared with the national average of 8 per cent. (However, this is not representative of the whole sample, for the non-questionnaire section had a considerably lower proportion of children.) An indication of the stability of the families is given by the length of time they have lived in the district; as shown in Table III, 42 per cent. of the families had lived in the same house for 10 years or longer. Only one-tenth had lived in their present house for less than 2 years, and of these the great majority had lived in another house in the district or had worked in the district for a considerable time. Altogether, less than 2 per cent. of the families in the questionnaire section had migrated into the district during the last 2 years.

The economic status of these households, summarized in Table IV, was fairly similar to that found in England and Wales as a whole. Among the occupied men in the questionnaire households there was some excess of men in Social Class III and some deficit of men in Social Class IV and V occupations, as compared with S.E. London or with England and Wales, and this slight difference was fairly consistent in all age groups. Similarly, considering heads of households only, the questionnaire households had some excess of Social Class III heads and some deficit of Social Classes IV and V as compared with

TABLE III

PERCENTAGE DISTRIBUTIONS OF HOUSEHOLD FEATURES QUESTIONNAIRE SECTION ONLY

Household Features		Questionnaire Households	Great Britain 1 per cent. Sample
No. of Persons in Household	1	7·8	10·8
	2	20·4	27·6
	3	26·5	24·8
	4	24·3	19·1
	5	12·3	9·6
	6 or More	8·7	8·2
	All Households	100·0	100·0
	Average Number in Household	3·49	3·16
No. of Children under 16 years	None	41·1	56·8
	1	28·2	21·3
	2	18·1	13·8
	3 and 4	10·7	7·0
	5 or More	1·9	1·1
	All Households	100·0	100·0
Duration of Residence in Present House (yrs)	Less than 2	10	—
	2–4	27	—
	5–9	21	—
	10–14	17	—
	15 or More	25	—
	All Households	100	—

TABLE IV

PERCENTAGE DISTRIBUTIONS OF SOCIAL FEATURES QUESTIONNAIRE SECTION ONLY

Social Features		Questionnaire Households	S.E. London	Great Britain
Social Class of Occupied Males	I	4·4	4·4	3·2
	II	15·0	16·2	14·3
	III	65·0	57·4	53·4
	IV	7·4	9·5	16·2
	V	8·2	12·5	12·9
	All Classes	100·0	100·0	100·0
Social Class of Heads of Households	I	2·3	—	3·3
	II	16·3	—	18·3
	III	63·8	—	49·6
	IV	9·3	—	16·4
	V	8·3	—	12·4
	All Heads of Households	100·0	—	100·0
No. of Earners in Household	None	8·3	—	7·4
	1	44·2	—	49·8
	2	33·9	—	28·7
	3 or More	13·6	—	14·1
	All Earners	100·0	—	100·0
	Mean Ratio "Earners to Persons" in Each Household	0·44	—	0·45
Duration in Present Job of Occupied Men (yrs)	Less than 1	9	—	—
	1–2	20	—	—
	3–8	31	—	—
	9–14	22	—	—
	15 or More	18	—	—
	All Occupied Men	100	—	—
Employment Status of Married Women aged 15–59	Housewives	59	—	—
	Employed part-time	19	—	—
	Employed full-time	22		
	All Married Women	100	—	—

the 1 per cent. sample of England and Wales; when examined by household size, however, it was noted that this divergence occurred mainly in the larger households, whereas in small households the social class distribution of the heads closely resembled that in households of similar size in England and Wales.

Examining another aspect of economic status—the proportion of earners among the members of each household—in the questionnaire households, the "earners to persons" ratio averaged 0·44, closely similar to the England and Wales average. For each size of household, too, this similarity was consistent, the ratio being lowest for one-person households, highest of all in two-person households, and thereafter declining progressively as household size increased; though large households had more adult earners they also had greater numbers of children and elderly dependants.

These earners were, of course, mainly men, and their relative stability is indicated by the duration of their current job. Only 9 per cent. of the occupied men had been in their present job for less than one year, whereas nearly one-fifth had been in the same job for 15 years or longer—and this latter group included men in their early thirties as well as older men. Among the women, the single women were mostly in full-time jobs. The married women were mostly housewives, and those who did have employment outside their homes were as commonly in part-time as in full-time jobs. It might be noted that, when the married women had young children under school age, very few indeed were either in full-time (4 per cent.) or in part-time (10 per cent.) jobs.

One other interesting family feature, relatives' medical history, is worth reporting here. In a small group of 92 randomly-selected households, a special retrospective-history questionnaire was asked; this included questions on the past domestic and medical history of the family and relatives, and was aimed at eliciting information about psychiatric illness. Often the housewife knew nothing about her husband's family and little about her own second-degree relatives, so the information is by no means complete. Even so, over one-third of the families gave a definite history of psychiatric illness, almost always among first-degree relatives; in most cases the history was one of admission to a mental hospital, in a few it was one of mental deficiency or of illness at home with a definite diagnosis. Another one-fifth of the families gave a doubtful history, such as "nervous breakdown". Less than half the families had no history whatever; and, in a few of these, we know from practice records that there was in fact a history of mental illness, presumably suppressed at the interview.

II. Frequency of Attendance and Illness

Having shown briefly that the patients in the practice sample were not a peculiar or abnormal population but were ordinary families, slightly larger than the national average, and in most ascertainable social features fairly similar to the people in S.E. London, it is proposed to outline several morbidity features and to show that, from the medical standpoint also, this sample was by no means abnormal. Three aspects of frequency are presented below—the proportion who attended the practitioners during the year, the number of times they attended, and the number of illness-episodes experienced by the adults—and in all three aspects the practice sample was fairly typical of attendance as found in other investigations.

An attender was defined as a patient having a consultation for *medical* purposes. An episode of illness was defined in terms of the patient's presenting complaint at consultation, and if the same complaint was made at further consultations this was counted as one illness-episode. Table V shows that, of the whole sample, over 70 per cent. were attenders at some time in the year; for children, the percentage was much higher and was similar for boys and girls, but for adults the percentage of attenders among men was significantly lower than among women. The number of consultations per attender averaged 5·6; among child attenders, the boys' average was much higher than the girls', but among adults the men attending had a lower average than the women. The illness-episodes occasioning these attendances (analysed only for adults) averaged 2·4 per adult attender, and an illness caused on average 2·5 consultations; it may be of interest to note that more than one-third of adult attenders had only

Table V

Attendances and Illnesses, by Age and Sex

Age (yrs)	<15		15+		Total Practice
Sex	Male	Female	Male	Female	
Proportion of Attenders (per cent.)	78	80	65	75	72
Consultations per Attender	5·5	4·4	5·6	6·1	5·6
Illnesses per Adult Attender	—	—	2·2	2·6	2·4
Consultations per Adult Illness	—	—	2·6	2·4	2·5

one illness-episode during the year. Combining both sexes and all ages, the patient sample had an overall average of 3·9 consultations per *registered* patient on the list, a figure in the middle of the range found in other general practice studies.

Fig. 2 shows that the percentage of attenders was high among young children. Among adult age groups there was no increase with age in the percentage who attended, except perhaps for men from age 45 years onwards, nor did increasing age bring

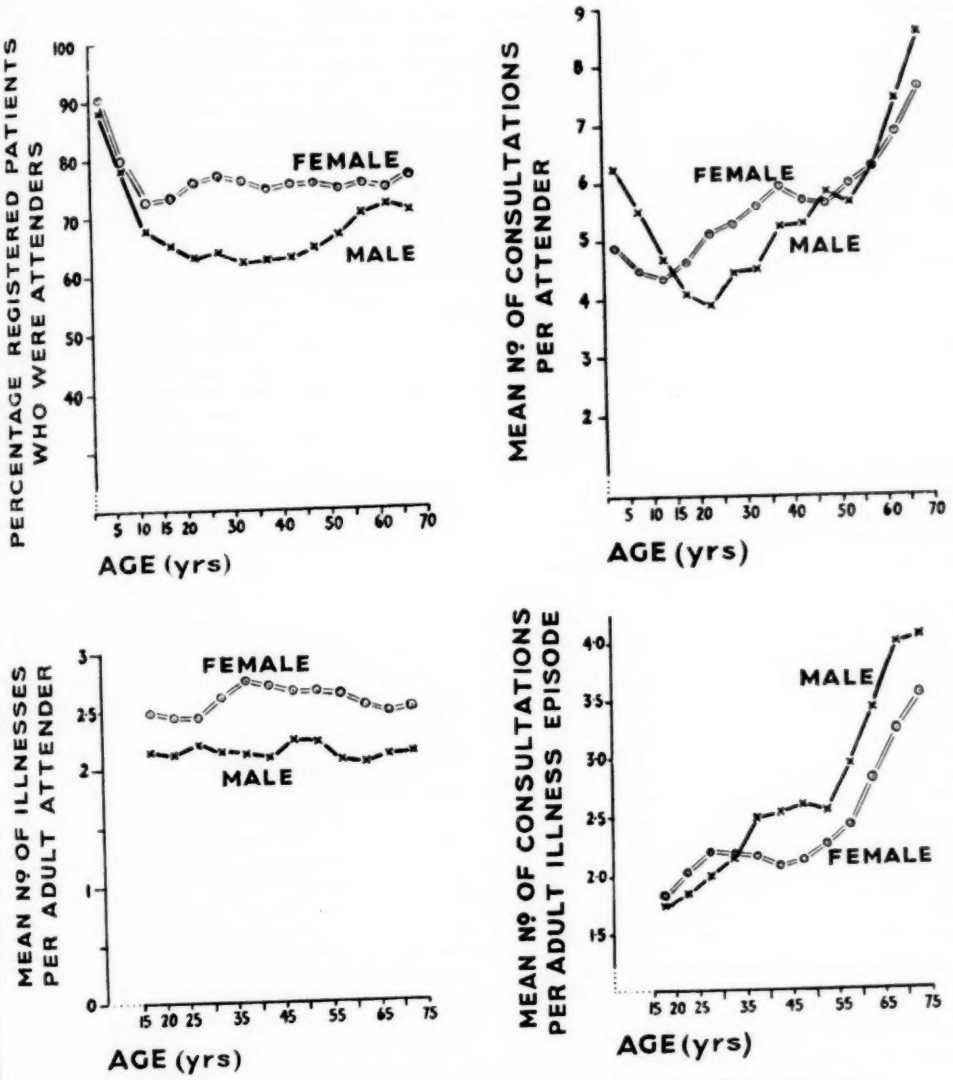

FIG. 2.—Percentage attending, frequency of consultation, and number of adult illness episodes, by age and sex.

with it an increasing number of illness-episodes. There was, however, a consistent increase with age in the consultations per adult attender, and this was reflected in the increase with age in consultations per illness.

Regarding length of time in the practice, the percentage of attenders tended to decrease, but the consultations per attending adult tended to increase, with increasing length of registration. Regarding size of patient group, the percentage of attenders was very similar in all sizes of group except those of one patient only, where, possibly because of "dead cards", it was somewhat lower. It is of interest to note that, in patient groups of two or more 92 per cent. had at least one attender; that is to say, the practitioners had had some contact with the group during the year.

Occupational social class of the men showed no definite association with any aspect of frequency; the percentage of attenders and the mean consultations per attender in Social Classes IV and V were perhaps a little higher than in Social Classes I, II, or III, but not significantly so. Job-duration for men under 45 years old, however, revealed that those who had been in their jobs for "short" (less than 3 years) or "intermediate" times (3—9 years) had significantly higher percentages of attenders than those who had held their jobs for 9 years or more. (This excess in the proportion of attenders was not due to the age composition of the "short" and "intermediate" job-duration groups; nor did those men who attended have a higher frequency of consultations than the attenders in the "long" job-duration groups.)

For the women, neither marital state nor child status nor employment showed strong connexions with attendance. Married and single women had a similar percentage of attenders and single women a slightly lower average of consultations per attender. Among the married, those in part-time jobs had a slightly lower percentage of attenders but more complaints per attender than either housewives or those employed full-time; and the oft-stated belief that "housewives bother the doctor more because they have more time" was certainly not borne out by our sample, for the housewives had a slightly *lower* average of consultations per attender than those employed full-time or part-time.

Of those at risk for the previous year as well as the risk year, 20 per cent. were 2-year non-attenders, and taking the subsequent year too, nearly 17 per cent. of those at risk were 3-year non-attenders. These may be a hard core of healthy persons. There may, of course, have been "dead cards" among this one-sixth of the sample, but there was undoubtedly a large number of live cards, ascertained from other members of their patient-group.

As there were four doctors in the group practice—two men and two women—it is of interest to make some comparison of their patients. The most marked difference was in sex composition: for the two male doctors, 56 per cent. of their adult attenders during the risk year were men patients; for the two female doctors, only 24 per cent. of their attenders were men. One of the male doctors had a high proportion of elderly and very young men among his patients.

It was found that, just as women patients had a higher frequency of consultations per attender than men, so did the two female doctors have a higher consultation rate than the two male doctors, and this applied to their men patients as well as to their women patients. Even allowing for the age differences, there appeared to be real differences between the patients coming to each of the doctors. For example, it has already been mentioned that the female doctors had a relatively small proportion of men patients, but those that they did have were very frequent attenders. Though one cannot state the extent of self-selection of patients within the practice, these differences and much other evidence indicate that self-selection certainly occurred.

Conclusion

The material presented here outlines certain family and social features of the 20 per cent. sample of a London group practice, and the consultations made by the adults. In frequency of doctor-consultation and of illness, the patients in the London practice appeared similar to those of other general practices; and in family and social features the patient sample consisted of ordinary families, stable in their homes and jobs, and having social contacts in the area and relatives near-by. The psychiatric hospital rate, both out-patient and in-patient, was relatively low compared with national hospital data. Against this background there was no reason to expect either extremely low or extremely high rates of psychiatric ill-health; yet, as shown elsewhere (Shepherd, Fisher, Stein, and Kessel, 1959), high rates were in fact found, and, from the general characteristics of the patient-sample, it would appear unlikely that these were due to abnormal family or economic pressures. In the present study, no association with family characteristics such as size or occupational class, or

with family history of mental illness, has been found; perhaps further studies may produce more positive findings.

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PSYCHIATRIC MORBIDITY IN A LONDON GENERAL PRACTICE

BY

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This paper presents an account of morbidity in a suburban practice in London with special reference to psychiatric disability. Clinical and administrative features of this practice (Chalke and Fisher, 1957) and its social and demographic characteristics (Stein, 1960) have also been described, and an outline of the present investigation has been presented elsewhere (Shepherd, Fisher, Stein, and Kessel, 1959).

All registered National Health Service patients aged 15 years or over whose surnames began with four randomly chosen letters (A, B, U, V) were surveyed for one year (March, 1956, to February, 1957). These 911 adults represent about 10 per cent. of the practice and are all included in the 20 per cent. sample described by Stein (1960).

In accordance with the method of Backett, Shaw, and Evans (1953), an illness was defined as any disturbance of a patient's health resulting in at least one consultation. All attendances for preventive or administrative purposes were included, but routine ante-natal and post-natal attendances were omitted. Each patient who consulted the doctor, either at the surgery or at home, was the subject of a discussion between the author and the practitioner who had been principally responsible for his care during the study year. At this discussion the patient's record card was examined in detail; the presenting complaint, the diagnosis, and the number of consultations recorded for each separate illness were noted, together with the total number of consultations during the year. The entries on the patients' record cards had not been designed for future research, but in discussion the practitioners were generally able to complete any necessary details of the recorded illnesses.

Psychiatric morbidity in general practice is best considered within the framework of general morbidity, but to do this it is necessary to modify the International Statistical Classification of Diseases, Injuries, and Causes of Death (W.H.O., 1948-9). The Classification is based mainly on pathological criteria, but general practitioners are often forced to work on a symptomatic basis. This is especially true of trivial or self-limiting conditions and of cases of acute illness in which the need for prompt treatment precludes diagnostic precision. This raises problems for the taxonomist which have been considered by Howard (1959) who, though he used an extended classification designed for general practice, was still unable to classify 18 per cent. of illnesses. Members of the Social Medicine Unit of the Medical Research Council (Backett and others, 1953) found in a single practice that nearly half of the reported "diagnoses" merely described symptoms or signs. These, using the I.C.D., would mostly be relegated to Category XVI (Symptoms, Senility, and Ill-defined Conditions).

To avoid this difficulty, symptom diagnoses were, in this study, referred to the relevant systems of the body, and Category XVI was reserved for cases coming under the general heading of "Debility" (see Table I, opposite). Some latitude was taken in assigning all complaints of headache, dizziness, or faintness without further qualification to the group of nervous system diseases (Category VI), in relegating diseases of the eyes and ears to a separate subgroup, and in assigning infectious diseases to the bodily system principally affected. It also seemed preferable to favour the respiratory system rather than the circulatory system where the symptoms fitted both, and to create a special group for patients being treated for obesity, whether at their own or their doctor's suggestion. If two conditions presented at the same consultation, they were considered as separate illnesses, but a single illness classifiable under more than one system was placed in the system principally involved.

TABLE I

COMPARATIVE MORBIDITY RATES

Numbers of attending patients having at least one illness in system stated

Sex	Males		Females	
International Classification Category (modified)	All Attenders	Patients with Conspicuous Psychiatric Morbidity*	All Attenders	Patients with Conspicuous Psychiatric Morbidity
V. Mental, psycho-neurotic and personality disorders	13	12	35	24
VI. Diseases of the nervous system	27	8	54	12
Diseases of the eyes or ears	51	6	67	13
VII. Diseases of the circulatory system	14	1	29	8
VIII. Diseases of the respiratory system	105	11	148	27
IX. Diseases of the digestive system	60	7	85	22
X and XI. Diseases of the genito-urinary system, including complications of pregnancy, childbirth, and puerperium	10	3	81	16
XII. Diseases of the skin and cellular tissue	53	6	81	14
XIII. Diseases of the bones and organs of movement	77	9	116	25
XVI. Ill-defined conditions, chiefly debility	14	3	40	10
— Obesity	4	—	32	4
— Complaint not ascertainable, including pyrexia of unknown origin	17	1	19	2
— "Well" attendances	13	1	26	1
Total Numbers of Attending Patients	253	28	367	58

In assessing psychiatric morbidity, great reliance was placed on the general practitioners' opinion, as this usually incorporated a knowledge of the patient extending over many years, together with experience of his family and awareness of social and economic difficulties. Preliminary discussions were held to delineate what were to be considered illnesses with important psychiatric traits, and it was agreed that there were three modes of presenting psychiatric disability:

(1) Some patients pointed the way explicitly by complaining of being anxious, depressed or fearful, irritable, nervous, or unable to cope with life's routine.

(2) Some patients presented somatic symptoms which could not adequately be explained by physical illness, *e.g.* some cases of insomnia, palpitations, and menstrual disturbances.

(3) Some patients' psychological reactions to indisputable physical illness were in some way abnormal.

All such patients were regarded as displaying conspicuous psychiatric morbidity (C.P.M.) during the survey year. There remained a number of patients who had recognizable personality disorders but whose current illnesses were not, in the general practitioner's opinion, affected by these. When considering psychiatric prevalence rates (see Table II, opposite), these patients were listed separately ("Other Patients with Abnormal Personality"), but elsewhere they have been included with "Other Attenders". Hence the definition of C.P.M. was "attendance during the survey year for one or more illnesses in which an important psychiatric component had been detected by the general practitioner".

Having classified the patients in this way (C.P.M. Group and Other Attenders) an attempt was also made to grade all illnesses according to the confidence with which they could be regarded as falling within the ambit of psychological medicine (Empirical Scale). The first category in this scale (Grade I Illnesses) included the most obvious cases—the psychoses and all those illnesses in which the patient made his complaint in psychological terms. In the remaining illnesses the nature of the symptoms was considered and use was made of the examination findings, hospital reports where available, and the doctors knowledge of subsequent developments. Where it was considered that physical factors had not played a significant part in the causation of an illness, it was placed in the middle of the scale (Grade II); common examples were dizziness and sleeplessness and cases of dyspepsia where peptic ulcer had been excluded. The third and last category (Grade III) comprised all those illnesses with findings indicative of organic disease; as doubtful cases were also included here, the empirical scale probably understates psychiatric morbidity.

GENERAL MORBIDITY (Modified International Classification).—Table I shows the total number of patients with at least one illness during the study year and the number in thirteen diagnostic groups. The largest of these corresponds to respiratory illnesses, nearly half the attenders having had one or more such illnesses in the year. Orthopaedic, digestive, and skin disorders, together with disorders of

TABLE II

PSYCHIATRIC MORBIDITY ASSESSED BY PRACTITIONERS

One year prevalence rates (persons)

Sex	Age (yrs)	Persons		Patients with Conspicuous Psychiatric Morbidity			Other Patients with Abnormal Personality		
					Prevalence Rates			Prevalence Rates	
		Registered	Attending	No.	Per cent. of All Registered	Per cent. of All Attenders	No.	Per cent. of All Registered	Per cent. of All Attenders
Male	15–34	117	84	9	8	11	6	5	7
	35–59	173	111	13	8	12	8	5	7
	60 and Over ..	65	45	6	7	11	1	2	2
	Not Known ..	38	13	—	—	—	—	—	—
	All Ages including Not Known ..	393	253	28	7	11	15	4	6
Female	15–34	169	129	15	9	12	12	7	9
	35–59	200	147	31	16	21	15	8	10
	60 and Over ..	99	76	10	10	13	7	7	9
	Not Known ..	50	15	2	—	—	—	—	—
	All Ages including Not Known ..	518	367	58	11	16	34	7	9
Both	15–34	286	213	24	8	11	18	6	8
	35–59	373	258	44	12	17	23	6	9
	60 and Over ..	164	121	16	10	13	8	5	7
	Not Known ..	88	28	2	—	—	—	—	—
	All Ages including Not Known ..	911	620	86	9	14	49	5	8

the eyes and ears, were also large groups, and genito-urinary disorders were very frequent in women. This last category included all abnormalities associated with childbearing, but not routine ante- or post-natal attendances. For the reasons already stated, the proportion of circulatory diseases was smaller and that of disorders of the nervous system larger than in comparable surveys. Nearly a tenth of the women were treated for obesity during the study year. 5 per cent. of the registered patients (8 per cent. of attenders) had illnesses classifiable in Category V (Mental, Psychoneurotic, or Personality Disorders) of the I.C.D.

Age trends were observable for some of the disease groups, but were nowhere pronounced. Circulatory system disorders increased with age (both sexes), as did nervous system disorders and orthopaedic illnesses (females only); but genito-urinary disorders among women and skin disorders in both sexes were less frequent in the elderly. Other morbidity rates were independent of age.

PSYCHIATRIC MORBIDITY (C.P.M. and Other Personality Defects).—Close scrutiny of the practice records revealed 86 patients with conspicuous psychiatric morbidity out of 911 registered adults, giving a one-year prevalence rate for persons of 9 per cent. A further 49 patients (5 per cent.) were considered by the practitioners to have displayed abnormalities of personality independent of their presenting illnesses. Table II shows the prevalence rates in three age groups for the two sexes. The well-recognized higher rate of psychiatric morbidity among women was confirmed, but, with the exception of an increased prevalence among women aged 35–59, the rates were not noticeably influenced by age.

Only three patients were recognized as psychotic during the year, and there were two mental defectives. For the remainder it was not always possible to arrive at a formal diagnosis from the available information, but anxiety, hypochondriacal, or depressive reactions characterized about 60 per cent. and hysterical reactions about 15 per cent. A few had phobic symptoms and in some cases the abnormality of personality had led to the consultation.

The practitioners had referred eight of these patients to a psychiatrist during the year, not always for the first time, and a ninth patient was referred by a hospital physician. 10 per cent. of the C.P.M. patients had therefore come to the attention of a psychiatrist during the year, including the three psychotic patients. These apart, it was often difficult to decide what factors had militated for their referral. Dr. Michael Shepherd and I interviewed thirty patients in the practitioners' surgery and found several with clinical states commonly encountered in routine psychiatric out-patient practice who had not been referred to hospital.

Patients with conspicuous psychiatric morbidity had, naturally, a high rate of illnesses in Category V (Mental, Psychoneurotic, and Personality Disorders) of the I.C.D. They had also, men especially, a high rate of ill-defined conditions (Category XVI) and of nervous system disorders, not surprising in view of the composition of this modified category. Otherwise, the morbidity records of the C.P.M. patients resembled those of other attenders.

According to the empirical scale (Table III), slightly less than half of the C.P.M. patients presented psychological symptoms (Grade I) and the same number (36) had at least one illness in which physical factors did not appear to play a causal role (Grade II). There remained fourteen C.P.M. patients whose illnesses were explicable on a physical basis, the psychiatric component having been manifested by elaboration of the degree of suffering or by the protracted course of the disability.

TABLE III

PATIENTS GROUPED BY EMPIRICAL SCALING OF ILLNESSES

Grade of Illness	Patients with Conspicuous Psychiatric Morbidity	All Other Attenders	All Attenders
I*	36	11	47
II* but not I	36	152	188
III* only	14	358	372
Total Patients ..	86	521	607†

* See text.
† Excluding thirteen patients who attended for reasons other than illness.

The following example illustrates this type of case:

Case 1, a 37-year-old woman, living by herself, made twelve consultations during the year for herpes zoster, a prolapsed intervertebral disk, and a twisted ankle. She became very worked up over the backache and would sit in the surgery twisting her hands and behaving melodramatically in a manner quite outside the bounds of normality.

Eleven further patients had psychological symptoms, but in these cases the practitioners felt that the mental distress could be laid at the door of physical illness. One case is particularly instructive:

Case 2, a middle-aged woman, complained of abdominal pain and was depressed. No abnormality was found on examination at hospital, and the depression worsened when the patient learned of this. Eventually she required E.C.T. for the depression. Shortly afterwards a carcinoma of the uterus was discovered.

In this case the practitioner considered that the depression was caused by the physical disease and therefore, despite its severity, he did not include the patient in the C.P.M. group.

Because of the retrospective nature of the study it was not possible to arrive at a reliable estimate of inception rates. Instead, attendances in the 12 months after the study year were scrutinized to discover how many of the 86 C.P.M. patients were still attending. Information was available for seventy of them, of whom 52 had the same symptoms as in the previous year, and by that criterion the illness had continued or returned. Nine cases were doubtful and nine had either not attended during the subsequent year or had consulted their doctors only for other, unrelated conditions.

CONSULTATIONS.—Both men and women in the C.P.M. group had higher than average consultation rates (Table IV). The women consulted more often than the men, a sex difference that did not obtain for the other attenders. The high rates were in part attributable to the fact that 40 per cent. of the C.P.M. patients visited their doctor ten or more times in the year, compared with less than 20 per cent. of the other patients. Conversely, it was uncommon for C.P.M. patients to have consulted only once or twice. Multiple attendance by some of these patients was not the only factor responsible, however. When only those patients who consulted less than ten times in the year were considered, high rates

TABLE IV

FREQUENCY OF CONSULTATION DURING THE SURVEY YEAR

Sex	Reason for Attendance	No. of Patients	Proportion (%) of Patients having				Mean Consultations per Person	Mean Consultations per Person (excluding patients with 10+ consultations)
			1–2 Consultations	3–5 Consultations	6–9 Consultations	10+ Consultations		
Male	Patients with Conspicuous Psychiatric Morbidity ..	28	14	25	21	39	8·82	4·88
	Other Patients	216	38	32	17	13	5·15	3·39
	All Attenders	244	35	32	18	16	5·57	3·51
Female	Patients with Conspicuous Psychiatric Morbidity ..	58	17	9	33	41	10·12	5·09
	Other Patients	305	37	26	20	18	5·26	3·64
	All Attenders	363	34	23	22	21	6·05	3·81

were still found. C.P.M. patients who attended many times during the survey year also did so in the years immediately preceding and following (Table V).

TABLE V

MEAN ANNUAL CONSULTATION RATE IN STUDY YEAR AND ADJACENT YEARS

Year	Study	Preceding	Subsequent
Patients with Conspicuous Psychiatric Morbidity	9·7	8·4	9·0
All Other Attenders	5·2	4·8	5·5
All Attenders	5·8	5·4	6·0

In terms of the empirical scale, C.P.M. patients made the same average number of consultations for physical illnesses (Grade III) as did the other patients (Table VI) and all the "extra" consultations were equally divided between Grade I and Grade II illnesses. Consequently, physical disease, as judged by the number of consultations, was evenly distributed between the C.P.M. and other patients. Taking the diagnoses directly from the record card, Stein found similarly, that the number of physical episodes were the same for those who had psychological symptoms recorded on the card as for other patients.

TABLE VI

MEAN ANNUAL CONSULTATIONS FOR EACH GRADE OF ILLNESS

Grade of Illness	I*	II*	III*	Total for All Illnesses
Patients with Conspicuous Psychiatric Morbidity	2·2	2·5	5·0	9·7
All Other Attenders	0·0	0·9	4·3	5·2

* See Table III—also text.

Consultations also show how the medical work was distributed. 38 per cent. of all consultations in the survey year were with men and 62 per cent. with women. 23 per cent. of all consultations were with C.P.M. patients, but half of these were for physical illnesses. According to the empirical scale, 7 per cent. of all consultations were for Grade I illnesses, 21 per cent. for Grade II illnesses, and 72 per cent. for Grade III illnesses.

SOCIAL FACTORS.—Though the C.P.M. patients did not differ from the other patients in respect of the social indices which Stein has reported, nevertheless the practitioners regarded social factors as important determinants of the psychiatric morbidity in approximately 20 per cent. of cases. Usually these were domestic or family troubles which would have been difficult to detect without the practitioners' special knowledge.

DISCUSSION

CRITERIA OF IDENTIFICATION.—Using a modified version of the International Classification of Disease (I.C.D.), the pattern of psychiatric morbidity in the survey practice was found to be typical. Thus the one-year prevalence rate for Category V (Mental, Psychoneurotic, and Personality Disorders) was 3·3 per cent. for males and 6·8 per cent. for females. According to Logan and Cushion (1958), who studied 106 general practices in England, the corresponding rates for patients over 15 years were 3·8 and 7·9 per cent. respectively.

Though useful for this sort of comparison, the I.C.D. figures certainly underestimated the true prevalence of psychiatric morbidity. For when attendance records for the survey year were scrutinized and discussed with the general practitioners, it was found that no less than 7·0 per cent. of the men and 11·2 per cent. of the women in the practice had attended for illnesses which revealed conspicuous psychiatric traits (C.P.M.). The difference between the I.C.D. and C.P.M. estimates of psychiatric morbidity was due to the fact that there were many C.P.M. cases with physical symptoms—with or without established physical disease—which would lead them not to be included in Category V of the I.C.D.

The revised estimates of psychiatric morbidity were doubtless better than the original ones, but they still left unsolved an important problem. It will be recollected that only 36 of the 188 patients in the middle of the empirical scale (Grade II) were included in the C.P.M. group. Yet according to some authorities all Grade II illnesses—inasmuch as the symptoms did not appear to have a physical basis—should have been classified as psychological. It is obvious that, until there is a satisfactory and generally agreed classification of psychiatric diseases, the problem will continue to arise whether such diseases should or should not be regarded as psychogenic, and there will continue to be widely different estimates of psychological disorders in general practice.

The need for more precise criteria of psychiatric morbidity is shown by the absurdly different estimates which might have been derived from the present investigation:

Psychological Criteria	*Estimate of Psychiatric Prevalence* (per cent.)
Category V of the I.C.D. ..	5
Grade I (Empirical Scale) ..	8
C.P.M. (as defined)	9
Grades I and II (Empirical Scale)	38
—do— plus "Psychosomatic Disorders"	52

This is clearly a ridiculous state of affairs, yet even a ten-fold difference between the highest and the lowest estimates does not exhaust all possibilities: if all patients whose physical illnesses were complicated by a psychological overlay had been added to the above groups, well over half the practice would have been included.

DOCTOR VARIATION.—Stein has shown that the patients of the four doctors severally differed in respect of age and sex. Further, the general morbidity pattern among patients of individual doctors displayed differences which suggest selection.As patients were free to choose which of the four doctors they consulted, it would be surprising had this not been so. On the other hand, the very availability of a choice of doctor probably prevented drift of patients away from the practice as a whole.

Variation in rate of diagnosing psychiatric cases persisted even after standardization for age and sex. Thus, for every case identified by the team as a whole, one doctor identified 1·30, another 1·24, another 0·92, and another 0·47. These differences are not compensated for by the addition of patients considered to have displayed personality abnormalities only. They are susceptible of two explanations:

(1) Variability between doctors in their discernment of psychological causation,

(2) Differences between the patients leading each to choose which of the four doctors they thought would be most responsive to their needs.

To distinguish between these, the equivalent of the "breeder" and "drift" hypotheses of ecological studies, was beyond the scope of this survey.

AGE TRENDS.—Despite popular opinion to the contrary, the prevalence of psychiatric disability was not affected by age, except for the relatively high incidence among middle-aged women. This finding is in close agreement with that of Fry (1957), and accords with the large studies of morbidity in general practice carried out for the General Register Office by Logan (1953, 1955) and the community studies in Baltimore carried out by Pasamanick, Roberts, Lemkau, and Krueger (1957).

REFERRAL TO HOSPITAL.—That general practice and hospital figures seemed to differ in respect of age must reflect the referring habits of practitioners. Only 10 per cent. of the diagnosed patients were referred, and, the psychotics excepted, it was difficult to identify the factors which determined referral. Nevertheless, practitioners referred to the psychiatrist only those patients who had psychological symptoms, though some C.P.M. patients with physical symptoms may have been referred to medical or surgical clinics. Davies (1958) observed that many of the illnesses presented by consecutive out-patients at a general medical clinic warranted a psychiatric diagnosis and that the practitioner's referring letter often showed him to be aware of this. The selection of patients for psychiatric opinion remains an arbitrary process and requires mutual consideration by psychiatrists and general practitioners so that the existing services can be used most profitably.

SUMMARY

The one-year prevalence rate for persons with conspicuous psychiatric morbidity (C.P.M.) in a London group general practice was 9 per cent. A further 5 per cent. had personality defects not associated with their presenting illnesses. In both categories there were more women than men, but the rates were largely independent of age.

Only three out of 86 C.P.M. patients had psychoses. Most suffered from anxiety states, and 36 presented psychological symptoms. 10 per cent. of the C.P.M. patients were referred to a psychiatrist during the year.

Using a modification of the International Classification of Diseses, C.P.M. patients recorded an excess of mental ilness, of illness loosely referable to, the nervous system, and of ill-defined conditions chiefly debility, during the survey year. Consultations for other reasons were similar to those for all other attenders. Most of the psychiatric illnesses persisted into the year following the survey.

The C.P.M. patients had much higher mean annual consultation rates than the other attenders, though the average number of their consultations for physical diseases was the same. The high consulta-

tion rates of these patients were also present in the years before and after the study year and were not solely due to an excess of very frequent attenders. C.P.M. patients were responsible for 23 per cent. of all consultations, but only half of these were for their psychological illnesses. 7 per cent. of all consultations dealt directly with psychological symptoms.

C.P.M. patients did not differ from others in respect of measured social factors, but the doctors mentioned domestic and family problems as important determinants in 20 per cent. of cases.

The difficulties of delineating and classifying psychological illnesses in general practice are discussed. The extent to which use of the W.H.O. system of classification underestimates such morbidity and the need for strict criteria are stressed.

This study is the result of collaboration between four general practitioners (Drs. Michael and Ida Fisher, Dr. Charles Benn, and Dr. Lilian Morgan), a medical statistician (Dr. Lilli Stein), two psychiatrists (Dr. Michael Shepherd and the author), and a psychiatric social worker (Mrs. K. Colwell).

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COMPARATIVE STUDY OF ATTITUDES TO THE REHABILITATION OF PSYCHIATRIC PATIENTS

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It has been estimated that over 80 per cent. of the beds in mental hospitals are occupied by long-stay patients (Royal Commission, 1957), and it has also been shown that the chances of discharge for patients who have remained continuously in a mental hospital for 2 years have so far been relatively small (Brown, 1960); they have ranged from 1 in 12 in the third year of stay, to 1 in 100 after 10 years, and 1 in 200 after 30 years.

Pendellswood Review and Rehabilitation Unit at Netherne Hospital was opened in April, 1957, in an attempt to resettle more of these long-stay patients in the community (Bennett, Folkard, and Nicholson, 1960). In the Unit, which has accommodation for 43 male and 51 female patients, there is an emphasis upon productive work, communal activities, and group discussions. The criteria for selecting patients to the Unit from other wards in the hospital are that they should have been in hospital for at least 2 years, be relatively stabilized and socially acceptable, have reasonable current work records within the hospital, and be under the age of 55 years.

The staff of the Unit comprises a part-time consultant psychiatrist, four ward nurses, and a psychiatric social worker, in addition to which two administrative nurses and two occupational therapists perform duties connected with the running of the Rehabilitation Unit. All of the staff meet together regularly to discuss and review the patients, and to make decisions about their work and social placement, and a local Disablement Resettlement Officer also attends these meetings.

A social research programme has been developed in an attempt to assess the social adjustment of the patients and to measure and evaluate the work of the Unit.

Preliminary experience would suggest that the rehabilitation of many such patients is likely to be a lengthy and difficult task, and therefore any final assessment of outcome must form part of a long-term research programme.

Patients Studied

Although the Rehabilitation Unit has accommodation for 51 females and 43 males, the number actually resident fluctuates somewhat, because of transfers of patients to and from the Unit, and the discharge of patients from the hospital.

For research purposes it was decided to study all those patients who were resident in April, 1957, when the Unit was opened and the investigation was started. These comprised 40 men and 45 women, but some data were not available and could not be obtained for every individual patient, so that there is some variation in the total figures in the Tables presented below.

75 out of the 85 patients had been given a diagnosis of schizophrenia, and the other ten were distributed in various other diagnostic categories. A detailed analysis was not possible, but a comparison between schizophrenic and non-schizophrenic patients did not reveal any significant differences with regard to the variables which were investigated. For the purpose of subsequent analysis they were all regarded as long-stay psychotic patients.

Aims and Method of Study

The aims of the study were first to compare the opinion of the patient with that of his relatives about his prospects of living and working outside the hospital, and secondly, to compare the social prognoses given by the staff, the patient, and the relatives with the patient's subsequent social placement.

A Patient-Attitude Questionnaire including questions related to rehabilitation, was given to the 40 male and 45 female patients, who were interviewed by the Unit Psychiatric Social Worker. The relatives

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of 57 of these patients were also interviewed, many of the same questions being used. The following analysis is based upon the cases in which both the patient and his relatives could be interviewed. In each case an attempt was made to contact the current key relative of each patient, defined as the closest relative who maintained some contact with the patient, and to whom the patient might return if discharged from hospital. Some patients had no living relatives, and in some other cases interviews were impracticable. The relationship to the patient in those cases where contact was made is set out in Table I.

TABLE I
INTERVIEWS WITH RELATIVES OF PATIENTS

Type of Relative Interviewed	Number of Patients		
	Male	Female	Total
Parent	20	13	33
Spouse	5	0	5
Sibling	6	9	15
Others	3	1	4
Total	34	23	57

(1) Attitudes of Patients and Their Relatives

If the patient returns to live at home when he leaves the hospital, the attitudes of relatives may be of considerable importance in that they may either reinforce or weaken the patient's attitude, and consequently affect his prospects of successful rehabilitation.

The data presented and discussed below illustrate some of the attitudinal differences between the patients and their relatives (Tables II to VI).

Table II indicates that, compared with their relatives, significantly more of the patients gave themselves high ratings for their previous work performance. This difference is shown further in that 33 of the forty patients who gave themselves high ratings were given low ratings by their relatives.

TABLE II
WORK PERFORMANCE BEFORE HOSPITALIZATION

Rating of Work Performance	Respondent		
	Patient	Relative	Total
Low	17	46	63
High	40	11	51
Total	57	57	114

$\chi^2 = 24 \cdot 367$; d.f. $= 1$; $p < 0 \cdot 01$

There were seven cases of agreement about high ratings, and thirteen cases of agreement about low ratings. It may be hypothesized that in cases where there is agreement between the patient and his relative, this will in part determine the aspirations and future work performance of the patient.

There were significant differences between the estimates of patients and their relatives of how easy it had been for them to live together before hospitalization (Table III); 36 of the patients and only two of the relatives thought that it had been easy, and in each of the twenty cases in which the patient thought it had been difficult, his relative was also of this opinion.

TABLE III
DIFFICULTIES IN LIVING TOGETHER EXPERIENCED BY PATIENTS AND THEIR RELATIVES

Living Together	Respondent		
	Patient	Relative	Total
Difficult	20	54	74
Easy	36	2	38
Total	56	56	112

$\chi^2 = 43 \cdot 373$; d.f. $= 1$; $p < 0 \cdot 01$

28 patients compared with only six of their relatives thought their prospects of discharge were good (Table IV). It is difficult to know whether any of these patients gave this response because they thought it was expected of them as members of a rehabilitation unit, but it is clear that most of the relatives do not expect the patients to leave the hospital. Amongst the patients themselves, significantly more of those who had been in hospital for over 5 years felt that their prospects of discharge were poor. ($\chi^2 = 4 \cdot 181$; d.f. $= 1$; $p < 0 \cdot 05$).

TABLE IV
PROSPECTS OF DISCHARGE FROM THE HOSPITAL

Prospects of Discharge	Respondent		
	Patient	Relative	Total
Poor	28	50	78
Good	28	6	34
Total	56	56	112

$\chi^2 = 18 \cdot 500$; d.f. $= 1$; $p < 0 \cdot 01$

Table V (opposite) shows that more of the patients wished to be discharged than actually expected this to happen, and relatives also showed more positive wishes than expectations. However, whereas most of the patients expressed a wish to be discharged

about half of the relatives preferred them to stay in hospital. There were 24 cases in which both the patient and his relative expressed a desire for discharge, but in the remaining 22 cases in which the patient wanted to leave hospital, his relative preferred him to stay in hospital.

TABLE V

PREFERENCE FOR DISCHARGE OR STAYING IN HOSPITAL

Preference	Respondent		
	Patient	Relative	Total
Discharge	46	28	74
Stay in Hospital	9	27	36
Total	55	55	110

$\chi^2 = 11{\cdot}933$; d.f. $= 1$; $p < 0{\cdot}01$

About four-fifths of the patients thought they were capable of working outside hospital, whereas only half of the relatives were of this opinion (Table VI). There were nineteen cases in which there was agreement about this, and only six cases in which the patient thought he would not be able to work but his relative thought that he could. Significantly more female than male patients thought they were capable of working outside hospital. ($\chi^2 = 4{\cdot}936$; d.f. $= 1$; $p < 0{\cdot}05$).

TABLE VI

ESTIMATE OF PATIENT'S ABILITY TO WORK OUTSIDE HOSPITAL

Outside Work	Respondent		
	Patient	Relative	Total
Could Work ..	39	25	64
Could Not Work	11	25	36
Total	50	50	100

$\chi^2 = 7{\cdot}335$; d.f. $= 1$; $p < 0{\cdot}01$

(2) SOCIAL PLACEMENT OF PATIENTS 2 YEARS AFTER ADMISSION TO REHABILITATION UNIT

It will be recalled that all the patients in the research sample had already been in hospital for at least 2 years when they were selected for the Rehabilitation Unit on April 25, 1957. Soon after they were admitted to the Unit a study was performed of the attitudes of the patient, his relatives, and the Unit staff. One of the main questions about rehabilitation was—"What do you think are the patient's prospects of being discharged from the hospital?" Table VII shows the prognoses given by these different respondents in relation to the social placement of the patients on April 25, 1959, 2 years after admission to the Rehabilitation Unit, and therefore at least 4 years after admission to the Hospital.

In April, 1959, twelve of the research sample of patients were both living and working outside the hospital, and another four patients were working outside, but returning each evening to the Rehabilitation Unit. These two groups of patients have been considered together in the present analysis, but, as some of them have only recently left the hospital, it is too early to evaluate the outcome of their social placement.

Weekly clinical conferences were held by the staff of the Rehabilitation Unit, and it was on the basis of decisions made at these meetings that the sixteen patients were placed in jobs in the community, and 22 other patients were transferred to other wards in the hospital as unsuitable for rehabilitation at that time.

A more detailed comparison was made of these two groups, excluding those patients who were still on the Unit, about whom a rehabilitation decision had not yet been made. Table VII shows that all of the staff and many of the patients showed a considerable degree of accuracy in the prognosis which they had given 2 years earlier.

TABLE VII

SOCIAL PLACEMENT OF PATIENTS IN 1959, COMPARED WITH PROGNOSIS IN 1957

Placement in April, 1959		Working Out of Hospital			Still Living in Unit			Transferred to Other Wards		
Social Prognosis in April, 1957		Good	Poor	Total	Good	Poor	Total	Good	Poor	Total
Prognosticator ..	Patient*	12	4	16	19	28	47	6	16	22
	Relative	3	11	14	3	29	32	0	13	13
	Doctor**	15	1	16	13	34	47	4	18	22
	Social Worker***	12	4	16	3	44	47	1	21	22
	Ward Nurse****	12	4	16	6	41	47	0	22	22

* $\chi^2 = 6{\cdot}567$; d.f. $= 1$; $p < 0{\cdot}01$
** $\chi^2 = 18{\cdot}244$; d.f. $= 1$; $p < 0{\cdot}01$
*** $\chi^2 = 17{\cdot}419$; d.f. $= 1$; $p\ 0{\cdot}01$
**** $\chi^2 = 20{\cdot}769$; d.f. $= 1$; $p < 0{\cdot}01$

These tests of significance are based upon a comparison of those patients who are working outside hospital with those who have been transferred to other wards.

The social placement of the patients is worked out on the basis of shared and agreed decisions by the staff. Table VIII shows the extent to which various staff members agreed with each other about the prognosis of the patients in relation to subsequent placement.

TABLE VIII

SOCIAL PLACEMENT IN RELATION TO CORRECT PROGNOSIS

Staff in Agreement	Working Out		Transferred to Other Wards	
	Good Prognosis	Total	Poor Prognosis	Total
Doctor, Social Worker, Nurse	10	(16)	15	(20)
Doctor, Social Worker	12	(16)	15	(20)
Doctor, Nurse ..	12	(16)	16	(20)
Social Worker, Nurse	10	(16)	19	(20)

There appeared to be a considerable degree of initial agreement amongst the staff before discussing the patients and deciding what shall be done with them. Where differences exist they seemed to be in part related to differing degrees of optimism and confidence in the staff members. The doctor was the most optimistic member of the staff, and expressed most confidence regarding those patients to whom he gave a good prognosis, whilst the social worker and the nurses were somewhat less optimistic, and were more confident regarding those patients to whom they gave a poor prognosis. In general, the doctor gave a good prognosis to more of the patients who subsequently worked outside the hospital, and the other staff members gave a poor prognosis to more of the patients who were subsequently transferred to other wards in the hospital.

47 of the 85 patients in the research sample are still living in the Rehabilitation Unit and are not working outside the hospital, and it seems likely that many of them will constitute a more difficult problem of rehabilitation than those who are already working. If the prognoses given by the staff prove to be as accurate for these patients as for those already reviewed, a high proportion of the remaining patients will probably be transferred to other wards. However, twenty of them were given good work ratings by the staff, and many of them could probably be productively employed in sheltered workshops either inside or outside the hospital.

Simmons and others (1956) found that the patient usually got his own way about any plans for rehabilitation. In the present study 22 patients said they preferred to stay in the hospital rather than be discharged; of these only one is working outside, sixteen are still in the Unit, and five have been transferred to other wards.

There were some differences amongst the staff about the extent to which particular patients were thought to be willing or able to leave the hospital. The doctor thought that 38 of the whole group were unwilling to leave the hospital of whom ten were capable of doing so; the social worker thought that 31 were unwilling of whom fourteen were capable; and the nurses thought that 26 were unwilling of whom eighteen were capable. Whichever of these estimates most accurately reflects the real situation, it would seem that the attitude of the patient may constitute one of the main obstacles to rehabilitation. Further research would be necessary to show why these patients do not want to leave the hospital, and what procedures could be adopted to change their attitudes and persuade them to leave.

DISCUSSION

It is not known how many of the present group of patients will eventually be discharged, nor what proportion of such patients will go to live with relatives when they leave the hospital. There are some cases where this is not practicable, and others in which it does not seem desirable.

Out of 82 patients in the Rehabilitation Unit, 48 said they were not sure where they could go to live if they left the hospital (Folkard, 1960). Simmons, Davis, and Spencer (1956) found a significant tendency for discharged mental patients to shift their social setting on discharge, a process which is associated with the breaking of family ties. There is some evidence to suggest that patients who go out and live away from home make a better social adjustment than those who return to live with relatives. Stringham (1952) stated that a job away from home was a factor favouring a successful adjustment outside hospital, and Freeman and Simmons (1958) found that patients living with parental families had a lower work performance than those living with conjugal families, and attributed this to the lower expectation of parents. Brown, Carstairs, and Topping (1960), in a study of schizophrenic patients discharged after more than 2 years' stay in a mental hospital, found that ability to remain out of hospital and level of social adjustment were related to the social group to which the patient went; patients staying with siblings or in lodgings did better than those staying with parents or with wives, or in large hostels.

The significance of the attitude of the parties involved in determining the discharge of patients is discussed by Simmons and others (1956), who found that there was often considerable disagreement about discharge plans between the hospital, the patient, and the relatives. As already noted, the patient almost always got what he himself wanted, usually when one or both of the other parties agreed with him, but also in the infrequent cases where they did not. These authors suggest that, in the discharge process, purely medical considerations are often overshadowed by social and interpersonal factors. Davis, Freeman, and Simmons (1957) suggest that it is possible to develop predictive instruments from patient's and relatives' attitude responses as well as from family structural differences.

The preliminary findings from the Rehabilitation Unit at Netherne Hospital suggest that the staff are better judges of the patient's chances of discharge than the patient himself, although in the light of subsequent social placement many of the patients are also seen to have given themselves a correct prognosis. The relatives of the patients have by far the lowest expectations of the patients' performance levels and chances of discharge, a factor which may have considerable implications for the rehabilitation of those patients who go to live at home when they leave the hospital.

Summary and Conclusions

(1) 85 patients who had been in a mental hospital for 2 years or more, and had been selected for a programme of rehabilitation, were asked questions about their attitudes to living and working outside hospital. The key-relatives of 57 of these patients were asked similar questions, with a view to identifying shared and differing attitudes, and to assessing the significance which these might have for the subsequent rehabilitation of the patient. Staff views on social prognosis were also obtained, and these were related to the social placement of the patients 2 years later.

(2) Compared with their relatives, significantly more of the patients gave themselves high ratings for their work performance before admission to hospital; thought it had been easy to live with their relatives; thought that their prospects of discharge from the hospital were good; expressed a preference to be discharged rather than to stay in the hospital; were confident of their ability to perform a job of work outside the hospital.

(3) Many of the patients seemed capable of living and working in the community, but did not want to leave the hospital, and this attitude appears to be one of the main obstacles to rehabilitation.

(4) The patient's self-prognosis, and the prognoses given by the staff of the Rehabilitation Unit were shown to be significantly accurate in relation to the social placement of the patients 2 years later. Differences in judgment amongst the staff appear to be related to differences in their optimism and confidence.

(5) The further outcome of the social placement of the patients will be assessed by a follow-up study of those patients who return to live in the community. This will be undertaken one year after they have left the hospital.

The writer is indebted to Dr. R. K. Freudenberg, Physician Superintendent of Netherne Hospital, to Dr. D. Bennett, Consultant, to Miss A. K. Nicholson, Psychiatric Social Worker, and to all of the staff of Pendellswood Rehabilitation Unit.

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YOUNG SMOKERS

AN ATTITUDE STUDY AMONG SCHOOLCHILDREN, TOUCHING ALSO ON PARENTAL INFLUENCE

BY

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Various studies of the smoking habits of school children in different areas have been made recently. This report is not so much concerned with the actual level of smoking among a particular group of school children, but with their attitudes towards smoking, their beliefs about the effect of smoking, and the relationship between the children's habits and attitudes and the smoking habits of their parents.

Method

Four corporation schools in Edinburgh were involved in this inquiry, one senior secondary school, one senior secondary technical school, and two junior secondary schools. Although these schools are in different areas of the city and the children in them may well be reasonably representative of those attending non-fee-paying schools in the city, a considerable proportion of children in Edinburgh go to fee-paying schools, so that this inquiry does not in anyway represent the whole school population of the city.

Each of the four schools was visited during January, 1959, by doctors from the City Public Health Department. They went into the classes and in the absence of the teachers asked the children to fill in a simple questionnaire.† It was explained that the teachers and headmaster would not see the forms, that the information was entirely confidential as no names were required, and that absolute veracity was important. These forms were completed in the classroom without the children comparing notes, and were given directly to the doctors. The school teachers were not involved in the inquiry. As far as possible all the classes in a school were visited on the same day, so that there would be relatively little opportunity for the children to discuss the survey and the replies would be spontaneous.

Although there were 4,180 children at these four schools at the time of the inquiry, only 3,224 forms were completed (77 per cent.). The reasons for the discrepancy were a high absentee rate because of an epidemic of influenza, and the inability of the doctors to cover classes which were engaged on any special activity outside the school.

Level of Smoking

The proportion of children who smoked was smaller than that found in similar studies near London (London School of Hygiene, 1959) and in the Isle of Wight.* One-third of the boys and two-thirds of the girls said that they had never smoked; just over one-quarter of the boys and only one in twelve of the girls stated they had smoked in the last 4 weeks (Table I).

TABLE I

PERCENTAGE SMOKING HABITS, BY SEX

Smoking Habits		Boys	Girls
Never smoked		34·8	66·5
Had smoked, but not in last 4 weeks		35·6	21·2
Smoked in last 4 weeks (usual number of cigarettes per week)	Less than 1	6·2	2·6
	1– 4	6·5	2·9
	5– 9	4·6	1·0
	10–14	3·0	0·5
	15–19	1·6	0·2
	20–29	2·2	0·2
	30–39	1·1	0·1
	40 or More	1·0	—
		26·2	7·5
Inadequate Answer		3·4	4·8
Sample† (=100 per cent.)		1,578	1,568

† 78 children failed to record their sex.

Nearly one-quarter of the boys who had smoked in the last 4 weeks (*i.e.* 6·2 per cent. of the boys' sample), can hardly be regarded as regular smokers since they smoked less than one cigarette a week on the average, while a further quarter of this group was smoking only from one to four cigarettes a week. About 12 per cent. of all the boys claimed to smoke as much as one cigarette a day regularly, just under 5 per cent. were smoking twenty a week or more, and

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† See Appendix.

*Personal communication from the Principal School Medical Officer.

1 per cent. claimed to smoke forty cigarettes a week or more.

Girls were less likely to have smoked at all than boys and had smoked relatively smaller amounts. Only 1 per cent. of all the girls in the inquiry said they usually smoked at least ten cigarettes a week.

An analysis by age showed that 17 per cent. of all the boys aged 11 or 12 had smoked in the last 4 weeks, and this proportion rose to 39 per cent. of those aged 14. After this age proportionately fewer children smoked. This is possibly because children who smoke are unlikely to stay on at school after they are 15 years old. The London inquiry (London School of Hygiene, 1959) suggested that smoking was more prevalent in the lower streams of secondary schools.

Among children aged 11 and 12 smoking was more common in the junior secondary or senior technical schools than in the senior secondary schools, both in the proportion who had ever smoked and the proportion who had smoked in the last 4 weeks (Table II). Among the 13 and 14-year-olds there was less difference between the types of school, though again the proportion who had smoked in the last 4 weeks tended to be lowest in the senior secondary schools. For the children aged 15 and over no consistent differences emerge, but this may be because of the processes of selection involved after this age.

To enter a senior secondary school, whether it is technical or not, children have to pass an examination at the age of 11, and such schools are thus, to some extent, similar to English grammar schools. Most of the children in the senior secondary technical school leave at the age of 15, whereas the other senior secondary school provides education to University entrance level. The secondary junior schools are comparable to the English secondary modern schools, and the great majority of children in these schools leave at the age of 15.

The differences in this inquiry between types of school were not so marked or so consistent as those found between the secondary grammar and secondary modern schools in the London inquiry.

The amount smoked by boys increased rapidly with age. Amongst those who had smoked in the last 4 weeks, nearly half of those aged 11 or 12 said they usually smoked less than one cigarette a week, and only one-sixth of those aged 14 or more said this, while the proportion smoking 20 or more a week

TABLE II

VARIATIONS IN PROPORTION OF CHILDREN WHO SMOKED, WITH AGE, SEX, AND TYPE OF SCHOOL

Sex	Type of School	Age (yrs)	Percentage who had ever smoked	Percentage who had smoked in last 4 weeks	Number of Children (=100 per cent.)
Boys	Junior Secondary	11, 12	58	20	227
		13	67	23	235
		14	73	42	284
		15	58	36	31
		16	—	—	—
		17 and Over	—	—	—
	Senior Technical	11, 12	59	20	104
		13	59	20	119
		14	76	39	62
		15	53	30	30
		16	—	—	—
		17 and Over	—	—	—
	Senior Secondary	11, 12	33	2	63
		13	59	19	70
		14	70	30	105
		15	73	33	67
		16	63	33	43
		17 and Over	63	33	33
Girls	Junior Secondary	11, 12	21	4	238
		13	31	7	256
		14	45	17	286
		15	28	3	29
		16	—	—	—
		17 and Over	—	—	—
	Senior Technical	11, 12	11	1	105
		13	37	11	91
		14	41	9	79
		15	—	—	—
		16	—	—	—
		17 and Over	—	—	—
	Senior Secondary	12	8	3	86
		13	7	1	73
		14	48	12	86
		15	33	8	72
		16	27	8	26
		17 and Over	—	—	—

rose from 3 per cent. at ages 11 and 12 to 34 per cent. for those aged 15 and over (Table III).

TABLE III

AMOUNT SMOKED BY BOYS WHO HAD SMOKED DURING THE LAST 4 WEEKS, BY AGE (PER CENT.)

Amount Smoked (Cigarettes per week)	Age (yrs)			
	11, 12	13	14	15 and Over
Less than 1	48	28	15	17
1– 4	25	28	25	22
5– 9	9	21	22	8
10–14	9	12	13	10
15–19	5	2	7	7
20–29	—	5	9	17
30 or More	3	2	7	17
Not Stated	1	2	2	12
Total Children Smoking (=100 per cent.)	67	91	175	72

PARENTS

SMOKING HABITS.—Half the mothers and three-quarters of the fathers of this group of children smoked regularly, according to the children. This agrees reasonably well with current estimates of the proportion of smokers in the general population (Tobacco Manufacturers' Standing Committee, 1959). This suggests that the children completed the questionnaires reasonably accurately.

When neither the child's mother nor his father smoked regularly, the child was less likely to do so than when either of his or her parents smoked. The proportion of "smokers" (*i.e.* those who said they had smoked during the last 4 weeks) was 29 per cent. among boys both of whose parents smoked and only 16 per cent. when neither parent smoked; for girls the corresponding proportions were 9 per cent. and 3 per cent. The proportions who had smoked but not in the last four weeks were not influenced by the parents' smoking habits to the same extent (Table IV).

KNOWLEDGE OF AND ATTITUDE TO CHILDREN'S SMOKING.—Children who had smoked during the last 4 weeks were asked whether their parents knew that they smoked. Their answers indicate that about half the children who smoked believed that their parents were unaware of it (Table V).

TABLE V

PARENTS' KNOWLEDGE OF CHILDREN'S SMOKING HABITS, PER CENT.

Parents who Know	Boys (age in yrs)			Girls (All Ages)
	Under 14	14 and Over	All Ages	
Both	22	33	30	22
Mother Only	10	19	15	15
Father Only	2	2	2	4
Neither	59	43	49	57
Not Answered	7	3	4	2
No. of Children Smoking (=100 per cent.)	157	246	420	122

Several children thought their mother knew they smoked while their father did not, but only very few thought that their father was the only one who knew. Younger boys thought that their parents were aware of their smoking habits less frequently than older boys. If answers here reflect the actual state of knowledge, parents are less likely to know if their daughters smoke than if their sons do.

These differences possibly arise because younger boys, and girls of all ages, tend to smoke less than boys of 14 or more, and because parental knowledge of smoking is highly correlated with the amount smoked. This is shown by an analysis of boy "smokers" aged 14. The proportion who said neither parent knew that they smoked fell from 71 per cent. of those who smoked less than five cigarettes a week, to 42 per cent. of those smoking between five and nine cigarettes a week, and to 21 per cent. of those smoking ten or more.

It is not, of course, possible from these data to reach any conclusions about the cause and effect of this relationship. Presumably the parents of a child who smokes frequently are more likely to find out about it by chance than the parents of a child who only smokes occasionally. On the other hand, if parents are aware of a child's desire to smoke and do not disapprove, it may be much easier for the child to obtain cigarettes and to be in a position to smoke ten or more cigarettes in a week.

It would not seem that parents very often give their children cigarettes directly, but the provision of

TABLE IV

RELATIONSHIP BETWEEN SMOKING HABITS OF CHILDREN AND PARENTS (PER CENT.)

Sex		Boys			Girls		
Parents who smoke		Both	One	Neither	Both	One	Neither
Children Smoking Habits	Never smoked	32	36	43	61	69	75
	Smoked but not in last 4 weeks	36	36	38	24	20	19
	Smoked in last 4 weeks	29	25	16	9	8	3
	Inadequate answer	3	3	3	6	3	3
No. of children (=100 per cent.)		547	653	261	556	670	241

sufficient pocket money may well be an important factor. When children who had smoked during the last 4 weeks were asked how they got these cigarettes only 4 per cent. said that they had obtained them from their parents with their parents' knowledge (Table VI).

TABLE VI

HOW CIGARETTES WERE OBTAINED, PER CENT.*

Method		Per cent.
Bought from	Machine	13
	Tobacconist	18
	Other Shop	55
	Person not Shop	2
From parents	With their knowledge	4
	Without their knowledge	4
Given	By brother or sister	6
	By friends	34
Other methods		3
No Answer		1
Number of Children Smoking (=100 per cent.)		544

* Several children gave more than one answer so the percentages add to over 100

The most common way for children to obtain cigarettes was to buy them themselves, and the other main method was to be given them by their friends. Unfortunately no data are available about the employment of these children, which may have been an important method of obtaining money for the purchase of cigarettes.

Children who said that either or both of their parents knew that they smoked were asked whether their parents tried to discourage them from smoking in any way, or whether they did not mind. Slightly less than one in five of these children said their parents did not mind, 71 per cent. said their parents tried to discourage them, and 11 per cent. were either unaware of their parents' attitude or did not answer this question. The proportion of parents who disapproved did not vary significantly between boys and girls but was higher for younger than for older boys.

Parental attitudes were related to some extent to their own smoking habits (Table VII), but even so 10 per cent. of the children with non-smoking parents maintained that their parents did not mind their smoking, and 66 per cent. of the children whose parents both smoked said that their parents tried to discourage them from smoking.

There was a significant difference between the children at the two types of school; 21 per cent. of parents did not mind their smoking, the corresponding proportion of the children at junior secondary schools (23 per cent.) was nearly twice as great. These differences in the attitudes of the parents of

TABLE VII

RELATIONSHIP BETWEEN PARENTS' SMOKING HABITS AND THEIR ATTITUDE TO THEIR CHILD'S SMOKING (PER CENT.)

Attitude to Child's Smoking	Parents who Smoke		
	Both	One	Neither
Does not mind	23	12	10
Tries to discourage	66	80	90
Not known or not answered	11	8	—
Number of Children Smoking (=100 per cent.)	105	100	21

the children at senior secondary schools compared with only 14 per cent. of those at junior secondary schools came from homes where both parents were non-smokers. In addition whereas 12 per cent. of the children at the senior secondary schools said their children in the junior and senior schools was not simply a reflection of their own smoking habits: for example, where only one parent smoked, there was still a difference between the proportion of children who said their parents did not mind their smoking (only 2 per cent. in the senior secondary schools and 22 per cent. in junior secondary schools).

BELIEFS OF CHILDREN ABOUT SMOKING AND HEALTH

When asked whether they thought smoking could be bad for the health, an overwhelming majority of children, 90 per cent. of boys and 93 per cent. of girls said "Yes" (Table VIII). Only 8 per cent. of boys and 6 per cent. of girls gave a negative reply to this question, while 2 per cent. of boys and 1 per cent. of girls either did not record an answer or were unwilling to commit themselves. Those who smoked were rather less likely to believe that it could be harmful to health. This relationship has also been observed among adults (Cartwright and Martin, 1958) and among doctors (Pyke, 1955).

TABLE VIII

RELATIONSHIP BETWEEN SMOKING HABITS AND BELIEFS ABOUT SMOKING AND HEALTH

Sex	Smoking Habits	Percentage believing smoking bad for health	Number of Children (=100 per cent.)
Boys	Never smoked	95	550
	Smoked but not in last 4 weeks	93	561
	Smoked in last 4 weeks	77	422
	All boys	90	1,578
Girls	Never smoked	94	1,041
	Smoked but not in last 4 weeks	92	332
	Smoked in last 4 weeks	79	121
	All girls	93	1,568

When asked in what way smoking could be bad for health, the most frequent reply (given by 55 per cent. of the boys and 60 per cent. of girls) was that

it could cause cancer (Table IX). A further 13 per cent. of boys and 12 per cent. of girls said that it was bad for the lungs but did not mention cancer. Various other conditions were thought to be caused by smoking, but apart from a cough none of these was mentioned by even as many as one-tenth of the boys or girls. Boys were more inclined than girls to connect smoking with breathlessness, and to mention its effect on performance in sport.

TABLE IX
RESPONDENT'S BELIEFS ABOUT THE EFFECTS OF SMOKING ON HEALTH (PER CENT.)

Effect of Smoking on Health	Boys	Girls
It causes cancer	55	60
It causes tuberculosis	2	4
It causes a cough	4	10
It causes breathlessness, short-windedness	6	2
It is bad for lungs (cancer *not* mentioned)	13	12
It affects the heart	1	1
It affects the eyes	1	—
It affects the stomach	1	1
It affects growth	1	1
It is bad for sport	3	1
Other specific effects	6	8
It affects health but respondent does not know how	12	11
It is not bad for health	8	6
Inadequate answer	2	1
Number of Children (=100 per cent.)	1,578	1,568

The proportion mentioning cancer was considerably higher than that found in the Isle of Wight. Both the boys and girls in the non-technical senior secondary schools mentioned cancer appreciably less often than the children in the other schools, but apart from this and the relationship with smoking habits, no significant variations were found in the answers to this question until the children were questioned about their ambitions in relation to smoking (Question 11).

AMBITIONS AND ATTITUDES OF CHILDREN

The final question was: "When you leave school or finish your education and start to earn your own money, do you hope you will smoke or not?" The children were also asked to give the reasons for their reply.

The great majority (88 per cent. of the boys and 96 per cent. of the girls) said they hoped that they would not smoke when they left school. 8 per cent. of boys and 3 per cent. of girls hoped that they would smoke, and 4 per cent. of boys and 1 per cent. of girls either could not make up their minds or did not answer the question (Table X). The proportion who intended to smoke was much greater amongst the present "smokers" than among the non-smokers, but even among the boys who had smoked in the last 4 weeks, three-quarters presumably hoped to stop smoking as they said they would prefer not to smoke when they left school.

TABLE X
RELATION OF PROPORTIONS HOPING THEY WOULD SMOKE WHEN THEY LEFT SCHOOL TO PRESENT SMOKING HABITS (PER CENT.)

Sex	Smoking Habits	Percentage hoping they would smoke when they left school	Number of Children (=100 per cent.)
Boys	Never smoked	0·9	550
	Smoked but not in last 4 weeks	4·5	561
	Smoked in last 4 weeks	24·2	422
	All boys	8·4	1,578
Girls	Never smoked	1·3	1,041
	Smoked but not in last 4 weeks	2·4	332
	Smoked in last 4 weeks	14·9	121
	All girls	2·6	1,568

The children's intentions about smoking were also related to their parents' smoking habits (Table XI). Among all the three groups of boys, those who never smoked, those who had smoked but not in the last 4 weeks, and those who had smoked during the last 4 weeks, the proportion who hoped they would smoke after they left school was lowest for those with two non-smoking parents. Interestingly enough, the proportion was highest, not in the group of boys in which both parents smoked, but in the group of boys whose mothers smoked but whose fathers did not. However, the numbers involved were small. The proportion of girls who hoped they would smoke was too low to make a useful analysis.

TABLE XI
PROPORTION WHO HOPE THEY WILL SMOKE ANALYSED BY THEIR OWN AND THEIR PARENTS' SMOKING HABITS (BOYS ONLY)

Child's Smoking Habits	Parents' Smoking Habits	Percentage who hope they will smoke	Number of Children (=100 per cent.)
Has never smoked	Both smoke	1·1	177
	Father only smokes	1·1	182
	Mother only smokes	2·2	45
	Neither smokes	—	108
Has smoked but not in last 4 weeks	Both smoke	4·3	187
	Father only smokes	5·5	182
	Mother only smokes	6·3	48
	Neither smokes	2·1	97
Smoked in last 4 weeks	Both smoke	25·2	151
	Father only smokes	23·5	119
	Mother only smokes	34·3	38
	Neither smokes	18·6	43

Among those who hoped they would smoke there was a relatively high proportion who thought smoking was not bad for health (36 per cent. of the boys and 29 per cent. of the girls), whereas only 6 per cent. of both boys and girls who hoped they would not smoke thought smoking was not bad for health.

Health was mentioned by an appreciable number

of children in giving reasons for hoping they would not smoke (Table XII), but the most frequent reasons were financial. Many said simply that smoking was a waste of money, while quite a number said they would rather spend their money on other things: clothes, a car, a motor-bike, dances, drink, sweets, and taking girl friends out were all mentioned here. One boy, a non-smoker, said: "My own father wastes over a pound on them every week".

TABLE XII

RESPONDENTS' REASONS FOR HOPING THEY WOULD NOT SMOKE WHEN THEY LEFT SCHOOL (PER CENT)

Reason	Boys	Girls
Waste of money or money could be put to other/better use	66	55
Bad for health (cancer not mentioned)	26	27
Causes cancer	10	11
Not good for sport	3	—
A dirty, unattractive, bad habit	6	25
An addiction, difficult to give up	3	5
Does not give pleasure	3	3
Stains fingers	1	3
Is a bad influence	1	—
Other reasons	3	3
Do not know	9	9
Number hoping they would not smoke† (=100 per cent.)	1,390	1,506

† Several respondents gave more than one reason.

A few children seemed to have rather an exaggerated idea about the amount of money they might save by not smoking: "If you saved all the money you spent on cigarettes you could be a rich man", and "If I don't smoke I might save £1,000,000".

Although only one in ten children mentioned cancer specifically in reply to this question, a number of the others who gave health reasons presumably had this danger in mind. "Because I want to live a bit longer", and "Because I do not want to die young" are replies which suggest a very literal acceptance of the danger of smoking.

The proportion mentioning health factors was similar for boys and girls, but whereas the boys were more concerned about the financial aspect, the girls more frequently condemned smoking as an unattractive, anti-social habit. A number apparently confined this feeling to their own sex, such as those who said: "I don't like to see a girl smoking", "For a girl to smoke I think it is common", "I think that women look very uncouth when they smoke. I do approve of men smoking because they can stand up for the worst". Others made more general comments, such as "It makes you slovenly" and "It is a horrible habit". Girls were more concerned about the discolouration of their fingers, while boys mentioned the harmful effects in relation to sport more frequently.

A fear of addiction was expressed by a number of children, one of whom said, "Many people can buy cigarettes but can't look after their family and that is because smoking has got a hold on them and they can't do without a smoke". Other diverse replies included, "My mother tells me she wishes she had never started to smoke", "I don't want a bad name in my area" and "I don't think I'll need stimulants of that kind".

Many of the children who hoped they would smoke gave no reason for this wish. The most frequent answer was simply that they enjoyed it, and a number said they thought it soothing or that it helped them to relax. "It makes you relax and forget you troubles" was one reply. Five boys and two girls said they just could not stop smoking. One or two obviously saw it as a symbol of manhood: "I would feel more grown up", "I hope I can smoke because I think it is a grown-up thing and I want to be grown-up", "Makes you feel like a man", "I want to smoke a pipe". One apparently sophisticated girl aged 12 who smoked five to nine cigarettes a week said here, "It is only one or two who get cancer". A number of replies indicated that smoking was regarded as a social pastime: "Because other folk smoke", "To give some to my mother". One girl who did not really hope to smoke when she left school said, "I will smoke a little in company to be polite". Finally, there was the boy aged 14 who said, "I hope I will smoke occasionally because I shall have to do something to pass the time at work".

DISCUSSION

Only a small proportion of this group of school children hoped that they personally would smoke when they left school, so that many children who smoke at school are not anxious to continue this practice when they leave. Although less than 1 per cent. of the children in this study said, categorically, that they could not give up smoking, it seems likely that many more, in spite of their ambitions for the future, have drifted into a habit which they will find difficult to break.

Awareness of the chief disadvantages of smoking, its expense and danger to health, has not enabled a considerable proportion of children to withstand its attractions or the social pressure involved in being offered a cigarette by a pal. While many children buy their own cigarettes, one-third of those who smoke are given at least some of their cigarettes by their friends. The probable influence of other social factors in their home is revealed by the association between the smoking habits of children and parents. This association may be genetical but, of course, not necessarily so, since similarities between children and parents in patterns of behaviour can result from

social and cultural pressures. Even parents who are smokers usually attempt to discourage their children from smoking, but they are slightly less likely to do this than if they are non-smokers.

Children in junior secondary schools are slightly more likely to smoke than those in senior secondary schools, but this may not be an effect of the school, since children in the former group more often had parents who smoke themselves and did not discourage their children from doing so.

We are glad to acknowledge the support and encouragement which we received from Professor J. H. F. Brotherston and Dr. H. E. Seiler. We should also like to thank the Director of Education, Mr. J. B. Frizell, his deputy, Dr. George Reith, and the four headmasters who must remain anonymous. Without their help this inquiry could not have been made. We acknowledge gratefully the work of Miss Alice Stephen, who did most of the coding and computing, and also the assistance given by a group of public health doctors in collecting the information on which this paper is based.

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APPENDIX

PRIVATE AND CONFIDENTIAL

School .....

Class .....

Age last Birthday .....

Sex: Boy ..... Girl .....

Put a tick beside your answer to each question

(1) Have you EVER smoked? Yes ..... No .....

If NO—that is if you have NEVER smoked—go on to Question 8

(2) Have you smoked at all during the last four weeks? Yes ..... No .....

If No—that is if you have NOT smoked during the last 4 weeks—go on to Question 8

(3) Do you usually smoke:
- Less than 1 cigarette a WEEK ... .
- From 1–4 cigarettes a WEEK ... .
- 5–9 cigarettes a WEEK ... ...
- 10–14 ciagrettes a WEEK ... ...
- 15–19 cigarettes a WEEK ... ...
- 20–29 cigarettes a WEEK ... — .....
- 30–39 cigarettes a WEEK ... ...
- 40 or more cigarettes a WEEK ... .

(*say how many in a WEEK*)

(4) How old were you when you started to smoke ONE OR MORE CIGARETTES A WEEK?

Never....., Under 8....., 8....., 9.....,
10....., 11....., 12....., 13....., 14.....,
15....., 16....., 17 or more .....

(5) How do you usually get your cigarettes?
- Buy them yourself from machine ... .
- Buy them yourself from tobacconist, that is, a shop that sells *only* cigarettes and tobacco ... ...
- Buy them yourself from a shop that sells other things as well ... ...
- Buy them from a person—not a shop .....
- From parents—with their knowledge .....
- From parents—without their knowledge ... ...
- Given to you by your brother or sister .....
- Given to you by friends ... ...
- Other method—please say how ... .

.....

(6) Do your parents know that you smoke at all?
- Yes, both parents know ... ...
- Mother only knows ... ...
- Father only knows ... ...
- Neither mother nor father knows ... .

(7) If either or both of your parents know you smoke, do they try to discourage you from smoking—in any way—or don't they mind?
- Don't mind ... ...
- Try to discourage ... ...
- Don't know ... ...

(8) Does your father smoke regularly—that is, every day? Yes ..... No .....

(9) Does your mother smoke regularly—that is, every day? Yes ..... No .....

(10) Do you think smoking can be bad for people's health in any way? Yes, can be bad ..... No ... .

If YES, in what way?

.....

.....

(11) When you leave school or finish your education and start to earn your own money do you hope you will smoke or not?
- Hope you will smoke ... ...
- Hope you won't smoke ... ...

Why do you hope that?

.....

.....

Please fold this sheet in two

Brit. J. prev. soc. Med. (1960), **14**, 35–38

BRITISH STILLBIRTHS AND FIRST WEEK DEATHS, 1950-57

BY

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It is well known that in the 1950s the incidence of stillbirths has continued to fall in Scotland but has stopped falling in England and Wales (*e.g.* Heady and Heasman, 1959). Here the incidence is studied with reference to sex, with an unexpected result, as is that of first week deaths. The sources of the data are the Annual Reports of the Registrar General for Scotland (1950–57) and the Statistical Reviews of the Registrar General for England and Wales (1950–57). As in the report of the Biological and Medical Committee of the Royal Commission on Population (1950), a comparison is made with the corresponding Netherlands figures, and a similar comparison is made with the Danish figures.

Sex Ratio of Stillbirths

Scotland

Sutherland (1949) pointed out that in Scotland the sex ratio of stillbirths fell from 1939, the year in which they first became registrable. This trend was reversed in 1947 (Table I), but was then resumed, until in 1956 and 1957 the sex ratio of Scottish stillbirths was lower than that of Scottish live births. In both these years the Scottish live birth sex ratio was 1·06.

England and Wales

Sutherland (1949) pointed out that in England and Wales the sex ratio of stillbirths fell from 1928, the year in which they first became registrable. This fall stopped in 1938 (Table I), but began again in 1952. The remarkable steadiness of the stillbirth sex ratio in England and Wales in 1939–51 stands in very striking contrast to the two-wave fall in the Scottish stillbirth sex ratio which occurred during the same period (Table I). Unfortunately no attempt can be made to find the reasons for this potentially illuminating contrast, as the causes of stillbirths in England and Wales are not registered.

TABLE I

SEX RATIO OF BRITISH STILLBIRTHS, 1938–57

Year of Occurrence of Stillbirths	Legitimate plus Illegitimate Stillbirths					
	England and Wales			Scotland		
	Male	Female	Ratio M : F	Male	Female	Ratio M : F
1938	13,349	11,380	1·17			
1939	13,105	11,204	1·17	2,112	1,720	1·23
1940	12,296	10,483	1·17	2,117	1,682	1·26
1941	11,268	9,608	1·17	2,065	1,628	1·27
1942	11,868	10,515	1·13	1,956	1,645	1·19
1943	11,469	9,793	1·17	1,835	1,657	1·11
1944	11,493	9,813	1·17	1,741	1,477	1·18
1945	10,367	8,966	1·16	1,518	1,427	1·06
1946	12,357	10,558	1·17	1,808	1,673	1·08
1947	11,792	10,003	1·18	1,912	1,645	1·16
1948	9,937	8,462	1·17	1,575	1,391	1·13
1949	9,129	7,818	1·17	1,402	1,261	1·11
1950	8,693	7,391	1·18	1,319	1,237	1·07
1951	8,669	7,316	1·18	1,292	1,186	1·09
1952	8,368	7,268	1·15	1,249	1,180	1·06
1953	8,311	7,370	1·13	1,197	1,107	1·08
1954	8,467	7,733	1·09	1,243	1,157	1·07
1955	8,303	7,526	1·10	1,229	1,098	1·12
1956	8,609	7,796	1·10	1,170	1,156	1·01
1957	8,613	8,002	1·08	1,195	1,183	1·01

Sex Incidence of Stillbirths

England and Wales

That the sex ratio of stillbirths in England and Wales fell from 1952 onwards, after having been stationary since 1938, is very largely due to one fact. This is that, while the male legitimate stillbirth rate in England and Wales was slightly lower in 1954–57

as a whole than in 1950–53 as a whole, the female legitimate stillbirth rate was higher in each of the 4 years from 1954 to 1957 than in any of the previous 4 years (Table II), and was indeed higher even in 1957 than in any year from 1947 to 1953. These secular differences, like others mentioned here, are too large to be due to simple binomial chance fluctuations in the proportions (Brass, 1959), and it is interesting to compare their trend with that of the corresponding rates for the Netherlands (Table II). (In the Netherlands stillbirths are counted from the 26th week, in Britain from the 28th week.) Moreover in England and Wales the female illegitimate stillbirth rate was higher in 1956 and 1957 than in any other year since 1948. Unfortunately, the absence of registration of the causes of stillbirths in England and Wales precludes the possibility of identifying the cause or causes responsible for the rise.

Scotland

The male and female stillbirth rates in Scotland were both considerably lower in 1954–57 than in 1950–53 (even so they were still considerably higher than the rates for England and Wales), but from 1953 onwards the female stillbirth rate fell only minimally—from 24·5 per 1,000 female births in 1953 to 24·2 per 1,000 female births in 1957. In Denmark the legitimate female stillbirth rate was 16·4 in 1950–53 and 16·5 in 1954–57.

Sex Incidence of First Day Deaths

Scotland

The death rate in the first 24 hours after birth in Scotland was slightly lower for females in 1954–57 as a whole than in 1950–53 as a whole, but in 3 of the 4 years from 1954 to 1957 the male first day death rate was higher than in any of the previous 4 years. In Scotland, unlike England and Wales, the number of deaths in the first 30 minutes after birth and in the rest of the first day respectively are not recorded separately.

England and Wales

In England and Wales the male and female death rates in the first 30 minutes after birth were both considerably lower in 1954–57 as a whole than in 1950–53 as a whole. The death rate from 30 minutes to 24 hours after birth was higher for males in 3 of the 4 years from 1954 to 1957 than in any of the previous 4 years and was also very slightly higher for females in 1954–57 as a whole than in 1950–53 as a whole (Table III, opposite).

In the Netherlands there was a continued fall throughout 1954–57 in the proportion both of male and female babies dying on the same calendar day as that on which they were born (Table III). That the rise in the first day death rate in England and Wales was much greater in males is of special interest in view of the fact that the rise in the stillbirth rate was confined to females.

TABLE II

LEGITIMATE FEMALE STILLBIRTHS IN ENGLAND AND WALES AND IN THE NETHERLANDS, 1950–57

Year of Occurrence of Legitimate Stillbirths	Netherlands			England and Wales		
	Legitimate Female Live Births + Stillbirths	Legitimate Female Stillbirths		Legitimate Female Live Births + Stillbirths	Legitimate Female Stillbirths	
		Absolute Number	Per 1,000 Legitimate Female Births		Absolute Number	Per 1,000 Legitimate Female Births
1950	111,519	2,090	18·7	328,113	6,916	21·1
1951	110,880	1,975	17·8	319,860	6,847	21·4
1952	112,532	1,915	17·0	318,917	6,814	21·4
1953	110,760	1,878	17·0	323,505	6,930	21·4
Aggregate, 1950–53 ..	445,691	7,858	17·6	1,290,395	27,507	21·3
1954	110,798	1,840	16·6	319,149	7,307	22·9
1955	111,961	1,789	16·0	316,107	7,100	22·5
1956	112,601	1,841	16·3	331,446	7,307	22·0
1957	113,937	1,854	16·3	341,705	7,491	21·9
Aggregate, 1954–57 ..	449,297	7,324	16·3	1,308,407	29,205	22·3

TABLE III

FIRST DAY DEATHS IN ENGLAND AND WALES AND IN THE NETHERLANDS, 1950–57

Year of Occurrence of First Day Deaths	Deaths in the Netherlands on the Calendar Day of Birth				Deaths in England and Wales between 30 minutes and 24 hours after Birth			
	Absolute Number		Per 1,000 Live Births		Absolute Number		Per 1,000 Live Births	
	Male	Female	Male	Female	Male	Female	Male	Female
1950	936	676	7·9	6·1	2,556	1,858	7·1	5·5
1951	907	681	7·7	6·2	2,578	1,814	7·4	5·5
1952	842	638	7·1	5·7	2,503	1,907	7·2	5·8
1953	891	662	7·6	6·0	2,485	1,909	7·1	5·7
Aggregate, 1950–53 ..	3,576	2,657	7·6	6·0	10,122	7,488	7·20	5·64
1954	837	623	7·1	5·6	2,579	1,899	7·4	5·8
1955	785	626	6·7	5·6	2,585	1,834	7·5	5·7
1956	740	547	6·2	4·9	2,656	1,885	7·4	5·5
1957	611	478	5·1	4·2	2,817	2,015	7·6	5·7
Aggregate, 1954–57 ..	2,973	2,274	6·3	5·1	10,637	7,633	7·48	5·68

SEX RATIO OF DEATHS IN THE FIRST WEEK

ENGLAND AND WALES

Takahashi (1954) showed that the sex ratio of first week deaths in Japan in 1941–42 and 1947–49—and also, according to data of Pfaundler (1942), in Germany—was highest on the third day after birth. In England and Wales, however, in both 1950–53 and 1954–57, the sex ratio of deaths rose very steeply from birth to the fourth day after birth (Table IV), after which it fell to the seventh day. It is particularly interesting that in England and Wales the sex ratio of deaths in the first 30 minutes after birth has been lower than that of deaths in the rest of the first day in every year since 1931, when the distinction was first recorded.

SCOTLAND

The sex ratio of deaths in the first week in Scotland was highest on the third day after birth in 1950–53, and on the fourth day after birth in 1954–57 (Table IV). The sex ratio of deaths fell from the third to the seventh day in 1950–53, and from the fourth to the seventh in 1954–57.

SUMMARY

In England and Wales the sex ratio of stillbirths was virtually stationary from 1938 to 1951. Since 1952, however, it has fallen, owing largely to a rise

TABLE IV

SEX RATIO OF BRITISH STILLBIRTHS AND DEATHS IN THE FIRST 4 DAYS OF LIFE

Country of Occurrence	Time of Occurrence	Deaths in 1950–53			Deaths in 1954–57		
		Male	Female	Ratio M : F	Male	Female	Ratio M : F
England and Wales	4th Day	2,400	1,257	1·91	2,177	1,223	1·78
	3rd Day	3,431	2,131	1·61	3,177	1,907	1·67
	2nd Day	4,127	2,865	1·44	3,917	2,725	1·44
	30 Minutes–24 Hours ..	10,122	7,488	1·35	10,637	7,633	1·39
	First 30 Minutes	1,474	1,213	1·22	1,352	1,211	1·12
	Stillbirths	34,041	29,345	1·16	33,992	31,057	1·09
Scotland	4th Day	265	173	*1·53*	249	139	1·79
	3rd Day	496	288	1·72	490	298	1·64
	2nd Day	739	539	1·37	646	484	*1·33*
	1st Day	1,914	1,403	1·36	2,074	1,439	1·44
	Stillbirths	5,057	4,710	1·07	4,837	4,594	1·05

in the female stillbirth rate in 1954–57 compared with 1950–53—a setback accompanied by a rise in the male death rate in the period from 30 minutes to 24 hours after birth. In 1950–57 the sex ratio of deaths in England and Wales rose steeply from birth to the fourth day after birth.

The fact that the female stillbirth rate and the male first day death rate rose in England and Wales in 1954–57 compared with 1950–53 is contrasted with the fact that in the Netherlands both these rates fell appreciably in 1954–57 compared with 1950–53. Regret is expressed that, in the case of female stillbirths, no attempt can be made to identify the cause or causes responsible for the rise, because the causes of stillbirth in England and Wales are not registered.

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APPENDIX

Incidence of Deaths from the Second to the Seventh Day

England and Wales.—Both the male and female death rates were lower in 1954–57 than in 1950–53 for each day from the second to the seventh day after birth.

Scotland.—The second day female death rate, after falling from 1950 onwards, rose in 1956 and 1957, and the third day female death rate was very slightly higher in 1954–57 than in 1950–53. Both the male and female death rates were lower in 1954–57 than in 1950–53 for each day from the fourth to the seventh day after birth. In all these respects the numbers were very small.

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FAMILY MORBIDITY

A SUGGESTED METHOD OF MEASUREMENT

BY

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It is usual to regard the family as a unit with specific attributes rather than as an aggregate of individuals with unrelated attributes. Is this view justified with regard to morbidity? Has a family a constant trend over the years?

The present paper demonstrates a method which may help to answer these questions. It is based on the measurement of morbidity as reflected in consultations with physicians and is exemplified by the experience of 46 families for 2 to 3 years.

The Families

The 46 families live in a housing estate for new immigrants in Kiryat Yovel, a Jerusalem suburb. They were selected from the 450 families of the estate in the following way. A stratified sample list of every third family was prepared, the original plan having been to study the whole sample. Preliminary examination of the contacts of some thirty families indicated the desirability of limiting the study to a more detailed analysis of a smaller group. Twenty of these thirty families come from North Africa or Near Eastern countries and it was decided to concentrate on this cultural group. The ten families from other countries were dropped and 26 further families with typical North African names were picked out of the stratified list.

These families immigrated during 1950–52 and belong to lower income groups. Their mean size of 4·8 persons (in 1955), rising to 5·5 persons (in 1957) is similar to the mean of 5·1 persons for Moroccan families in Israel. Most families consist of parents and young children (Table I); some have only one parent and in some cases the parents are older and the children grown up. Analysis has been confined to the nuclear family, as the few grandparents living with their son's and daughter's families seemed to have a different pattern of morbidity, unrelated to that of the family.

TABLE I

THE 46 FAMILIES, 1955–57, BY AGE AND SEX DISTRIBUTION OF FAMILY MEMBERS

Age (yrs)	Year						Total Person-Years	
	1955 (20 families)		1956 (46 families)		1957 (46 families)			
	Male	Female	Male	Female	Male	Female	Male	Female
0– 1	5	5	13	8	7	8	25	21
2– 4	7	10	17	21	20	18	44	49
5–14	12	10	35	27	40	36	87	73
15–59	26	19	61	56	61	57	148	132
60+	1	1	2	2	3	2	6	5
All Ages	51	45	128	114	131	121	310	280

Residents of this housing estate enjoy, together with those of adjacent estates, a high standard of integrated curative-preventive services from the family doctors and nurses of the Hadassah Community Health Centre. Physicians in the Centre record their findings in family files and, in addition, complete a daily consultation sheet (patient's name, age, file number, and diagnosis) for administrative purposes.

Use of the Current Morbidity Records

Family sheets were prepared from the records, and on these were listed the diagnoses made for each individual member during the year, the number of episodes of disease, and the number of consultations for each diagnosis. For each family, the total number of contacts for all conditions was computed, as well as that for acute respiratory and gastro-intestinal diseases (Annexe I, overleaf). For the first twenty families, the data for 3 years, 1955–57, was extracted from the family files. Data on the next 26 families, for the years 1956–57 only, were taken from the daily consultation sheets of the physicians. There was no significant difference in the mean number of consultations recorded per year in the family files and on

ANNEXE I

EXAMPLE OF ANNUAL FAMILY SHEET

PLACE.....Z..... FAMILY NAME.....A..... COUNTRY OF ORIGIN... MOROCCO
YEAR.....1956..... FILE NO. .....0000..... YEAR OF IMMIGRATION.....1952.....

Relation ... First Name Year of Birth			Husband T. 1930	Wife L. 1932	Son R. 1951	Son S. 1954	Daughter D. 1956 (May)
1956	January		Pain in leg X				
	February			Tonsillitis XX Pregnancy XX		Pyrexia unknown origin X	
	March			Pregnancy X		Bronchitis XXX	
	April			Pregnancy XX			
	June			Post-Partum X			Routine XXX
	July...						Routine XX
	August						Cough X
	October ...		Burn X				Routine X
	December...			Amoebiasis XX			Routine X
Totals	All Consultations	24	2	10	0	4	8
	Respiratory	6	0	2	0	3	1
	Gastro-intestinal	2	0	2	0	0	0
	Other	16	2	6	0	1	7

X = One doctor consultation.

the consultation sheets and it seems permissible to regard these sources as uniform.

Individual data on all consultations and on those for respiratory and gastro-intestinal diseases were grouped by age and sex and the mean rates per year were calculated (Table II). These mean rates were then taken as the expected rates for the particular age-sex group.

Expected consultation rates of members of each family, added up, became the expected rate for that family for that year. This expected family consultation rate changes from year to year with changes in the number of members and in their ages (Annexe IIB, opposite).

The actual number of consultations of individuals and of the family as a whole (Annexe IIA) divided by the expected value, gave consultation-indices for each individual and for each family (Annexe IIC).

TABLE II

THE 46 FAMILIES 1955–57: ANNUAL RATES OF CONSULTATION PER PERSON AND PERCENTAGE OF PERSONS CONSULTING, FOR ALL CONDITIONS, FOR ACUTE RESPIRATORY, AND FOR GASTRO-INTESTINAL DISEASES, BY AGE AND SEX

Sex	Age (yrs)	All Consultations		Respiratory		Gastro-Intestinal		Other Conditions
		Percentage Persons Consulting	Consultations per Person	Percentage Persons Consulting	Consultations per Person	Percentage Persons Consulting	Consultations per Person	Consultations per Person
Male	Total	79	5·0	55	1·8	28	0·6	2·5
	0–1*	(86)	19·5	(76)*	8·1	(68)*	3·5	(7·9)*
	2–4	95	7·5	79	3·3	55	1·4	2·7
	5–14	79	3·3	53	1·2	19	0·2	1·7
	15–59	73	3·7	46	1·0	19	0·3	2·4
	60+ **	(33)**	(3·1)	(17)	(0·8)	(0)	(0)	(2–3)**
Female	Total	88	7·2	61	1·7	26	0·5	4·9
	0–1*	(90)*	13·5	(62)*	4·4	(62)*	2·9	6·0
	2–4	87	5·9	77	2·2	33	0·6	3·0
	5–14	86	3·7	62	1·7	157	0·2	1·7
	15–59	89	9·5	55	1·4	26	0·5	7·5
	60+ **	(80)**	(3·0)	(20)**	(0·2)	(0)**	(0)	(2·8)**

* The rates for the age group 0–1 years are corrected with regard to the fact that about half of this group were born during a year of study and contributed on the average to only half that year; the percentages of persons consulting are not corrected and therefore represent an underestimate.
** These figures are based on less than 10 "person-years".

ANNEXE II

EXAMPLE OF PROFORMA FOR CALCULATION OF INDICES OF ONE FAMILY

PLACE ..... Z ..... FAMILY NAME ..... A ..... COUNTRY OF ORIGIN ..... MOROCCO
YEAR ..... 1955-57 ..... FILE NO. ..... 0000 ..... YEAR OF IMMIGRATION ..... 1952 .....

Relationship ... ... First Name ... ... Year of Birth		Husband — T. 1930				Wife — L. 1932				Son — R. 1951				Son — S. 1954				Daughter — D. 1956 (May)				Total Family			
Consultations		T	R	G	O	T	R	G	O	T	R	G	O	T	R	G	O	T	R	G	O	T	R	G	O
A. Observed Number of Consultations	1955	0	0	0	0	7	2	0	5	1	1	0	0	7	1	2	4					15			
	1956	2	0	0	2	10	2	2	6	0	0	0	0	4	3	0	1	8	1	0	7	24			
	1957	2	1	0	1	11	1	3	7	0	0	0	0	2	0	0	2	6	3	2	1	21			
	Total	4	1	0	3	28	5	5	18	1	1	0	0	13	4	2	7	14	4	2	8	60	15	9	36
B. Expected * Number of Consultations	1955	3·7	1	0·3	2·4	9·5	1·4	0·5	7·5	7·5	3·3	1·4	2·7	19·5	8·1	3·5	7·9					40·2			
	1956	3·7	1	0·3	2·4	9·5	1·4	0·5	7·5	3·3	1·2	0·2	1·7	7·5	3·3	1·4	2·7	7·9	2·4	1·7	3·5	31·9			
	1957	3·7	1	0·3	2·4	9·5	1·4	0·5	7·5	3·3	1·2	0·2	1·7	7·5	3·3	1·4	2·7	13·5	4·4	2·5	6·0	37·5			
	Total	11·1	3	0·9	7·2	28·5	4·2	1·5	22·5	14·1	5·7	1·8	6·1	34·5	14·1	6·3	13·3	21·4	6·8	4·6	9·5	109·6	34·4	15·1	58·6
C. Indices A/B	1955																					0·4			
	1956																					0·8			
	1957																					0·6			
	Total	0·4				1				0·1				0·4				0·7				0·5	0·4	0·6	0·6

T = Total. R = Respiratory disease. G = Gastro-intestinal disease. O = Other complaints.
* Expected according to Table of Averages of consultations by age and sex, for children born during the year, with correction according to number of months alive in that year.

In this way, the following indices were calculated:

(1) For each Individual:
All consultations during the whole period.

(2) For each Family:
(*a*) All consultations for every year;
(*b*) Consultations for respiratory diseases for the whole period;
(*c*) Consultations for gastro-intestinal diseases for the whole period;
(*d*) All consultations (other than *b* and *c*) for the whole period.

Application of Indices

Three illustrative questions may be asked to indicate the use of the indices:

(1) *Have members of a family a common trend in the numbers of their individual consultations?*

The distribution of individual indices by family for the 46 families is shown in Fig. 1. The following points were observed:

Nine with all individual indices below 1·0.

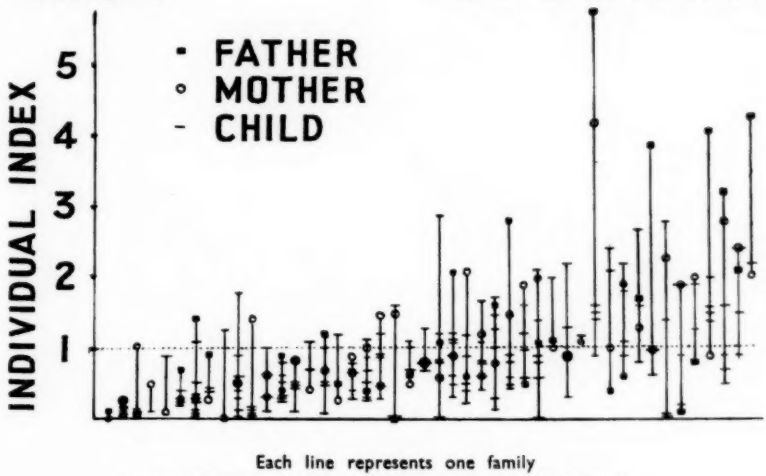


FIG. 1.—Distribution of individual indices by family (total consultation).

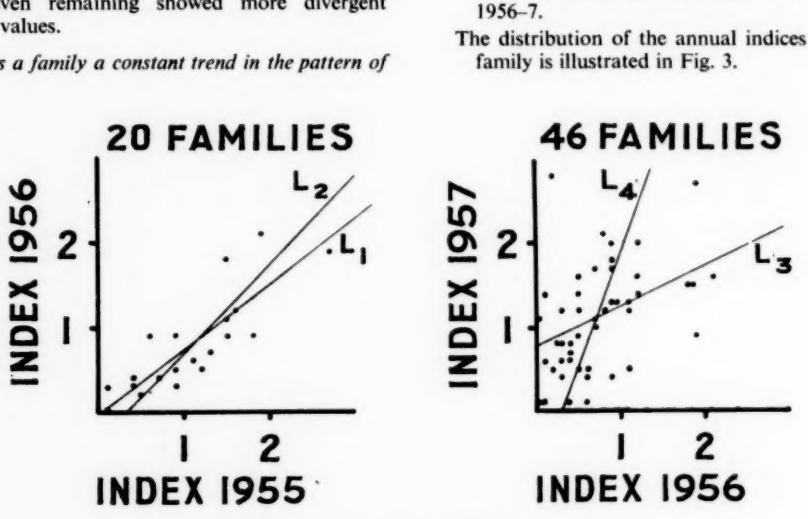
Two with all individual indices above 1·0.
Of 35 families whose indices crossed the 1·0 line:
Eight had all individual indices within an interval of one index unit.
Twenty had two-thirds or more of their indices within the space of one unit.
Seven remaining showed more divergent values.

(2) *Has a family a constant trend in the pattern of its consultations over the years?*

Fig. 2 shows the correlation of the indices of the first twenty families for 1955 and 1956 and for all 46 families for 1956 and 1957.

The corresponding coefficient of correlation is $r = +0{\cdot}85$ for 1955–56 and $r = +0{\cdot}45$ for 1956–7.

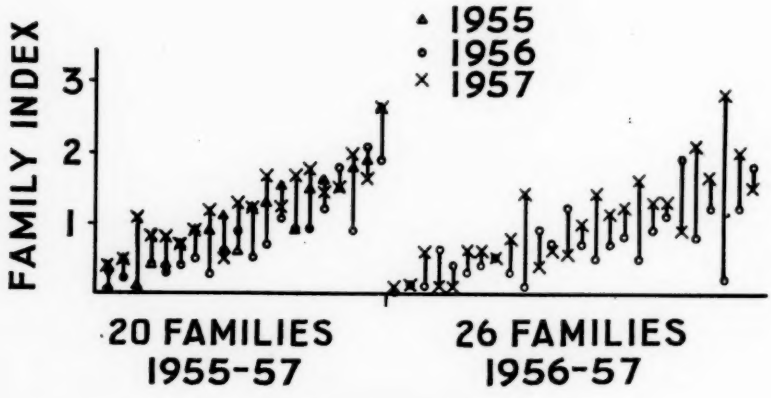
The distribution of the annual indices of each family is illustrated in Fig. 3.



Equations of Lines of Regression

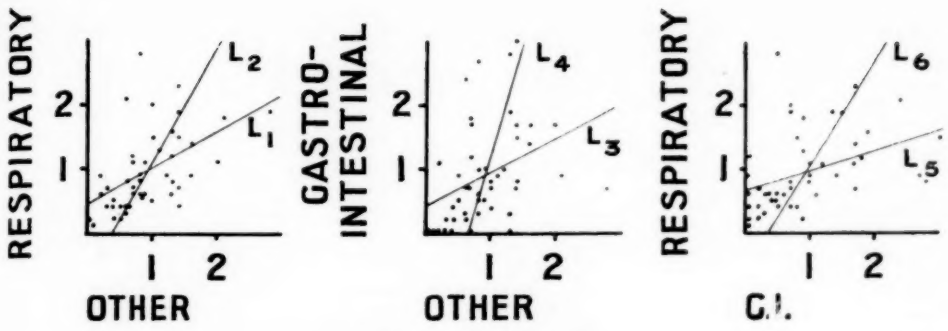
L_1 $y = 0{\cdot}79 + 0{\cdot}75\,(x - 1{\cdot}08)$ L_4 $y = 1{\cdot}11 + 0{\cdot}54\,(x - 0{\cdot}73)$
L_2 $x = 1{\cdot}08 + 0{\cdot}96\,(y - 0{\cdot}79)$ L_3 $x = 0{\cdot}73 + 0{\cdot}37\,(y - 1{\cdot}11)$

FIG. 2.—Distribution of annual family indices by year (total consultation).



Each line represents one family

FIG. 3.—Correlations between family indices for different diagnostic groups.



Equations of Lines of Regression

L_1	$y = 0{\cdot}95 + 0{\cdot}58\,(x - 0{\cdot}92)$	L_4	$x = 0{\cdot}92 + 0{\cdot}27\,(y - 0{\cdot}91)$
L_2	$x = 0{\cdot}92 + 0{\cdot}56\,(y - 0{\cdot}95)$	L_5	$y = 0{\cdot}95 + 0{\cdot}30\,(x - 0{\cdot}91)$
L_3	$y = 0{\cdot}91 + 0{\cdot}53\,(x - 0{\cdot}92)$	L_6	$x = 0{\cdot}91 + 0{\cdot}58\,(y - 0{\cdot}95)$

FIG. 4.—Correlation between family indices for different years (total consultation).

(3) *Are there "consultation-prone" families, independent of specific disease groups?*

Certain correlations for the 46 families are illustrated in Fig. 4.

The correlation coefficient for the family indices between consultations for respiratory and gastro-intestinal diseases is $r = +0{\cdot}42$, between respiratory and all other diseases is $r = +0{\cdot}57$, and between gastro-intestinal and all other diseases is $r = +0{\cdot}37$.

COMMENT

The purpose of this paper is to illustrate an approach to the measurement of family morbidity data rather than to answer specific questions. The method has been worked out for a small number of families by way of demonstration. There may well be no general answer to such questions, the results differing with family circumstances.

Family indices of morbidity may be used for picking out particular groups for further study or for special care, *e.g.* those with high or low consultation rates for a specific disease or for all diseases.

This method may also be used in the study of individual morbidity by comparing individual indices for various diagnoses and looking for correlations between them.

Thanks are due to the staff of the Hadassah Community Health Centre, Kiryat Yovel, particularly to Dr. Charlotte Kaplan, Acting Director, and Mrs. Ruth Behrens, Recorder, for their interest and help.

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INCIDENCE OF GASTRIC AND DUODENAL ULCER IN THE ROYAL AIR FORCE IN 1955

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In a previous paper (Baron and Vaughan Jones, 1958) we discussed the difficulties of estimating the prevalence of gastric and duodenal ulcer. We concluded, as had Doll (1952), that a population survey was the method of choice, and we studied the whole British Army of 1955. Some of our findings were sufficiently different from those of British and other civilians for us to seek another large population. In 1955 there were 245,320 men (officers and other ranks) in the Royal Air Force (R.A.F.). We have analysed the morbidity from peptic ulcer diagnosed that year for the first time.

Method

In 1955, diagnoses of gastric, duodenal, or peptic ulceration were made in 909 R.A.F. personnel. The medical documents could not be traced in three cases, but each of the remaining 906 (99·7 per cent.) was examined. A total of 347 were excluded: the initial diagnosis had been made before 1955 for 328 patients, 13 patients were female, and there had been errors of coding for six patients.

The remaining 559 men were admitted to hospital in 1955 for the first time with a diagnosis of peptic ulcer. In 126 patients the diagnosis was presumptive, in 46 because they had not had a barium meal, and in eighty because the results were negative.

The remaining 433 patients were considered to have had proven ulcers according to the criteria used in the previous paper:

(1) 366 duodenal and 24 gastric ulcers were shown by barium meal to the satisfaction of the radiologist concerned, as were two ulcers of which the site was not stated. One patient had both a gastric and a duodenal ulcer.

(2) Thirty duodenal, seven gastric, and one ulcer with site not specified were found at laparotomy to have perforated.

(3) One duodenal, one gastric, and one ulcer of unspecified site were found at laparotomy for haematemesis.

(4) Three duodenal and one gastric ulcer were found at elective gastric surgery.

(5) Neither gastroscopy nor autopsy contributed to this series.

In some cases the diagnosis was established by more than one method in the course of the year, and therefore the total of the above group, 438, is more than the number of patients, 433.

The one patient with an ulcer in both his stomach and in his duodenum, and the four patients with ulcers the site of which was not stated ("peptic", "pyloric") are omitted from further consideration. We have analysed the remaining 428 patients by age at diagnosis, by frequency of presentation with perforation, and by attack rate, as calculated from average figures for male R.A.F. personnel in 1955.

Results

Table I (opposite) shows the number of ulcers diagnosed, the ratio of duodenal to gastric ulcers, and the attack rates per 1,000 men at different ages. The number and proportion of ulcers which presented by perforation are shown in Table II (opposite).

Incidence of Duodenal Ulcer

The overall incidence of newly diagnosed duodenal ulcers was 1·6 per 1,000 men. Taking the 19-year-olds as the most representative of the same age group of the whole male population of the United Kingdom, there were 35 duodenal ulcers in 38,003 men of this age, a rate of 0·92 per 1,000 men.

The attack rate was lowest in 1·1 per 1,000 men in the 16–19 year age group and rose to a maximum of 3·4 per 1,000 men in the 35–39 year age group. The overall incidence was similar to that in the

TABLE I

NUMBER OF CASES, DUODENAL/GASTRIC RATIO, AND ATTACK RATES, BY AGE

Age (yrs)	No. of Men	No. of Ulcers Diagnosed		Ratio	Annual Incidence per 1,000 Men		
		Duodenal	Gastric	Duodenal : Gastric	Duodenal Ulcer	Gastric Ulcer	Both
16–19	57,587	62	3	20·7 : 1	1·1	0·05	1·1
20–24	120,592	160	13	12·3 : 1	1·3	0·1	1·4
25–29	22,426	46	4	11·5 : 1	2·1	0·2	2·2
30–34	16,342	40	8	5·0 : 1	2·4	0·5	2·9
35–39	13,353	45	0	—	3·4	0·0	3·4
40–44	8,859	29	2	14·5 : 1	3·3	0·2	3·5
45+	6,161	14	2	7·0 : 1	2·3	0·3	2·6
All Ages ..	245,320	396	32	12·4 : 1	1·6	0·1	1·7

TABLE II

NUMBER AND PERCENTAGE OF ULCERS WHICH PRESENTED BY PERFORATION, BY AGE

Age (yrs)	Duodenal			Gastric		
	Total Diagnosed	Perforated		Total Diagnosed	Perforated	
		Number	Per cent.		Number	Per cent.
16–19	62	2	3	3	1	33
20–24	160	14	9	13	2	15
25–29	46	5	11	4	1	25
30–34	40	4	10	8	2	25
35–39	45	2	4	0	0	—
40–44	29	3	10	2	0	—
45+	14	0	—	2	1	50
All Ages	396	30	8	32	7	22

British Army, and the distribution was similar to both the Army and the civilian series. As in the Army, the peak incidence was less than one-tenth of the civilian ulcer incidence.

INCIDENCE OF GASTRIC ULCER

The overall incidence of gastric ulcer was 0·1 per 1,000 men. There was only one gastric ulcer in 38,003 men aged 19, an attack rate of 0·03 per 1,000 men. In all there were only 32 gastric ulcers to analyse, but their distribution and minimum and maximum age incidences, were similar to the Army figures, while the overall incidence was about half that in the Army.

DUODENAL/GASTRIC RATIO

Table I shows that the ratio of duodenal to gastric ulcer in all age groups was 12·4 : 1. This figure is higher than that in the British Army in 1955 (7·65 : 1) and that found in 1942 (4·6 : 1) (Tidy, 1943), and is also higher than that in the U.S. Army in 1937–41 (5 : 1) or 1942–5 (10 : 1) (Hamilton, Sullivan, and Palmer, 1952).

The ratio under 45 years of age in the present series is 12·7 : 1 compared with 8·2 : 1 in the British Army. In civilian out- and in-patients the ratio in a London series was 5·5 : 1 (Jones and Pollak, 1945) and in Glasgow 13·2 : 1 (Jamieson, Smith, and Scott, 1949). In the only other population surveys, this ratio was 2·3 : 1 in men under 45 in London (Doll, Jones, and Buckatzsch, 1951), 2·3 : 1 in men under 50 in Drammen, Norway (Knutsen and Selvaag, 1947), and 4·05 : 1 in 1948 in men under 50 in Denmark (Alsted, 1953).

PERFORATED ULCERS

Table II shows that 8 per cent. of duodenal ulcers and 22 per cent. of gastric ulcers presented with perforation, figures similar to those found in the Army.

ARMY/AIR FORCE DIFFERENCES

The only major difference in the incidence of peptic ulcer between the Army and the R.A.F. is that there is a significantly lower incidence of gastric ulcer in the R.A.F. with, therefore, a higher duodenal/gastric ulcer ratio. We do not believe that there are different standards of diagnosis in these two Services, so that this lower incidence of gastric ulcer must be related to differences either in the environment or in the individuals recruited.

Environmental factors could include the quantity and quality of food, alcohol, and tobacco, the nature of employment and its hazards, and the areas of the military establishments. These factors are difficult to measure, and personal observations have not suggested any gross differences.

On the other hand, there were in 1955 undoubted social and educational differences in the composition of the Army and Air Force, related to their different fighting functions and equipment. Many clinicians have long suspected that there are social differences in peptic ulcer incidence, and between the types of ulcer. These clinical impressions are supported by the Registrar General's studies on Occupational Mortality. For example, in 1949–53, the Standardized Mortality Ratio of ulcers of the stomach

and duodenum increased from Social Class I (Professional) to V (Unskilled). This social gradient is very much steeper for gastric than for duodenal ulcer (Logan, 1959).

Summary

All in-patient case summaries of peptic, gastric, and duodenal ulcer patients in the Royal Air Force in 1955 were sought, and 99·7 per cent. were found, examined, and assessed. In 1955, 366 duodenal and 32 gastric ulcers were diagnosed for the first time in approximately 250,000 male personnel of the R.A.F. The overall incidence rates of duodenal and gastric ulcers were 1·6 and 0·1 per 1,000 men respectively. The data were analysed by age, and attack rates were estimated in the various age groups for proven gastric and duodenal ulceration, together with the proportions presenting with perforation. The results are in general similar to those previously found in the British Army, but the incidence of gastric ulcer is significantly less, and this difference is discussed.

We are indebted to Air Commodore J. S. Wilson and Group Captain R J. A. Morris of the Department of Hygiene and Research, the Air Ministry, for their help and for making available to us the medical records of patients with ulcer in the Royal Air Force. We wish to thank the Director-General of Medical Services, the Royal Air Force, for permission to publish.

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A FURTHER NOTE ON MONGOLISM IN TWINS

BY

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The discovery of an abnormality of the chromosomes of the cells of mongoloid defectives (Lejeune, Gautier, and Turpin, 1959a) and its later confirmation (Lejeune, Gautier and Turpin, 1959b; Jacobs, Baikie, Court Brown, and Strong, 1959) would seem to provide evidence that the causal mechanism of this condition operates at an early stage in the development of the affected individual. It now seems most likely that the condition is determined at or shortly after conception. In view of this evidence, it is surprising that examinations of concordance and zygotic type of affected twin pairs reported in the literature appear to show that the reported incidence of concordance is significantly less than that expected if monozygous pairs are invariably concordant.

The present author (Smith, 1955) and more recently Keay (1958) have examined series compiled from the literature and have considered the question in two ways:

(*a*) By comparing the proportion of concordant pairs with the expected proportion of monozygous pairs in a population of twin pairs born at maternal ages comparable with those at which mongols are usually born.

(*b*) By comparing the numbers of like and unlike sex pairs in pairs reported or presumed to be dizygous.

Both authors considered the possible effects of unrepresentativeness, and concluded that the data provided qualified support for the view that discordance might occur in monozygous pairs.

However, it has been suggested to the present author by Dr. Gordon Allen (personal communication) that it is fallacious to compare the observed frequency of concordance in affected pairs with the expected frequency of monozygous pairs in a population of unaffected pairs, if the hypothesis is to be tested that monozygous pairs are invariably concordant. Allen has advanced his reasons for this view elsewhere (Allen, 1955) and the argument relevant to the present discussion may be stated as follows:

In assuming for purposes of hypothesis that monozygous pairs are always concordantly affected and dizygous pairs usually although not invariably discordantly affected, we are assuming that the condition is determined at conception or at least before the stage at which a zygote splits to form a monozygous pair. Thus we are regarding the condition as being distributed not among twin pairs but among the zygotes that will ultimately present as twin pairs. A series of twin pairs ascertained by inclusion of pairs in which one or both members are affected will relate to two kinds of zygote; *i.e.* those who will subsequently split to form a monozygous twin pair and those who will simply be born in twos as dizygous twin pairs. If incidence is unrelated to zygotic type (and we have no reason to suppose that it is related), we should expect the proportion of affected and subsequently monozygous zygotes to approximate to the proportion of subsequently monozygous zygotes in the related population of unaffected twin zygotes.

Let the proportions of monozygous and dizygous twin pairs in a related population be $p : q$. Then the proportions of subsequently monozygous to subsequently dizygous zygotes will be $p : 2q$.

In a series of affected twin pairs drawn from such a population by inclusion of pairs in which one or both members are affected, all monozygous pairs will be concordantly affected but dizygous pairs may be either concordantly or discordantly affected. If m is the chance that a zygote may be affected and may introduce its pair to the series, the probability that any dizygous pair is concordantly affected is m^2 and the probability that it is discordantly affected is $2m(1 - m)$. The probability that a monozygous pair is affected and included is m. If these probabilities are applied to the proportions of monozygous and dizygous pairs in the related population, the proportions in the series are given as:

mp	monozygous	(concordant)
$2m(1 - m)q$	dizygous	(discordant)
m^2q	dizygous	(concordant)

Since in this case m is small, $2m(1 - m)q$ approximates to $2mq$ and m^2q is negligibly small, so that the proportions of monozygous and dizygous affected pairs in the series will be $p : 2q$, or similar to that of subsequently monozygous and subsequently

dizygous *zygotes* in the related population and not to that of monozygous and dizygous *pairs* in the related population.

In view of the new data which have accumulated since the earlier papers (Smith, 1955; Keay, 1958) were published, it seemed desirable to re-examine the question of concordance and zygotic type in the light of Allen's comment.

To the data assembled by Keay, which included series compiled by Øster (1953) and Smith (1955), the present communication adds the reported pairs shown in Table I.

TABLE I

EIGHT PAIRS OF TWINS SUPPLEMENTARY TO THOSE ASSEMBLED BY KEAY (1958)

Author	Date	Sex*	Zygotic Type
Mistlin	1957	F F	Unknown
Higgie	1957	M F	Dizygous
Ormiston	1957	M M	Unknown
Guilbride	1957	F M	Dizygous
Lewis	1957	M F	Dizygous
Mark	1957	F F	Unknown
Anthony and Hugh Thomas	1957	F F	Unknown
Murray	1958	F F	Unknown

* Sex of affected twin stated first.

Some reports have been omitted where either the diagnosis or the recording of sex seems unreliable. The total relevant data are summarized in Table II.

TABLE II

DISTRIBUTION OF TWIN PAIRS, ASSUMING THAT ALL PAIRS DISCORDANT FOR MONGOLISM ARE DIZYGOUS AND THAT ALL CONCORDANT PAIRS OF UNDETERMINED ZYGOTIC TYPE ARE MONOZYGOUS

Pairs		Concordant	Discordant	Total
Monozygous		25	0	25
Dizygous	Like Sex	1	76	77
	Unlike Sex	1	67	68
Total		27	143	170

In a previous communication (Smith, 1955), the expected proportion of monozygous pairs in a population of twin pairs born at the maternal age at which mongols are usually born was estimated as 26·3 per cent. This figure was derived from the maternal age distribution of 241 mongols born in Birmingham in the years 1942–1952 (Smith and Record, 1955) and the maternal age distribution of twins by zygotic type estimated by Weinberg's method from data published by the Registrar General. The expected proportion of zygotes resulting in monozygous twins is therefore $(26{\cdot}3 \div [147{\cdot}4 + 26{\cdot}3]) \times 100$ per cent. $= 15{\cdot}1$ per cent.

Table II shows that, of the 170 pairs on record, 27 pairs are concordant, of which two pairs must be accepted as dizygous (MacKaye, 1936; Nicholson and Keay, 1957). If the remaining 25 pairs are assumed to be monozygous, they represent 14·7 per cent. of the total number of pairs. Thus agreement is good between the expected and observed proportions of monozygous pairs on the assumption that all concordant pairs not acceptable as dizygous are, in fact, monozygous.

If we assume all discordant pairs to be dizygous and add to their number the two concordant pairs acceptable as dizygous, the numbers of like sex (77) and unlike sex pairs (68) do not depart significantly from the expected equality.

Thus the evidence at present available supports the view that affected monozygous pairs are invariably concordant for mongolism and that affected dizygous pairs are usually, although not invariably, discordant. Such a view is most readily reconciled with the hypothesis that the condition is determined at or shortly after conception.

SUMMARY

Data on mongolism in twins assembled from the literature are used to re-examine the question whether the observed frequency of concordance is consistent with the view that monozygous pairs are always concordant for mongolism, and that dizygous pairs are usually, although not invariably, discordant. The observed proportion of concordant and not dizygous pairs is 14·7 per cent. compared with an expected proportion of monozygous pairs of 15·1 per cent.

The number of like and unlike sex pairs among pairs considered to be dizygous does not differ significantly from the expected equality.

The data provide support for the view that monozygous pairs are always concordant and dizygous pairs usually discordant, a view that is most readily interpreted as evidence that the condition is determined at or shortly after conception.

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